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THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES

July 1955 • VOLUME 30 • NUMBER 7

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Predicting Academic Success Through Achievement and Aptitude Tests.....*Robert I. Watson*

A Course on Factors Influencing Scientific Judgment....*M. L. Johnson*

The "Full-Time" Controversy.....*Donald Fleming*

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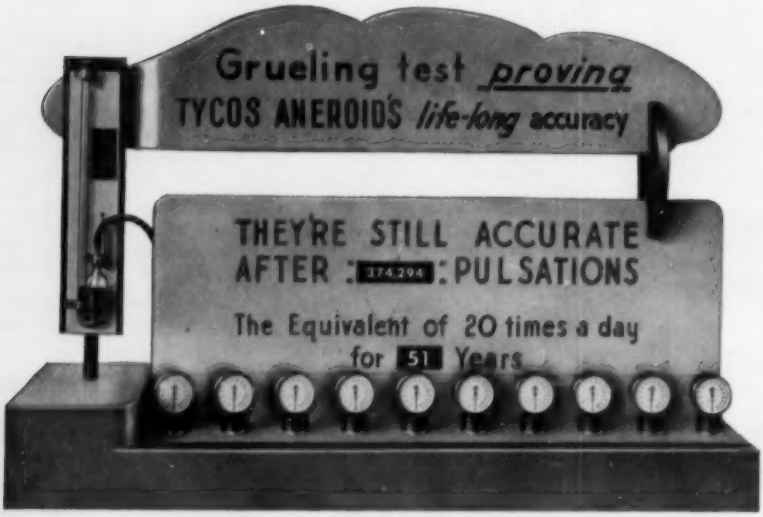

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1. Palmer, H., and Gallagher, D. J. A.: Brit. M. J. *2*:558 (Sept. 2) 1950. 2. Ziegler, D. K., and Torres, F.: Neurology *5*:197 (March) 1955. 3. Timberlake, W. H., and Schwab, R. S.: New England J. Med. *247*:98 (July 17) 1952.

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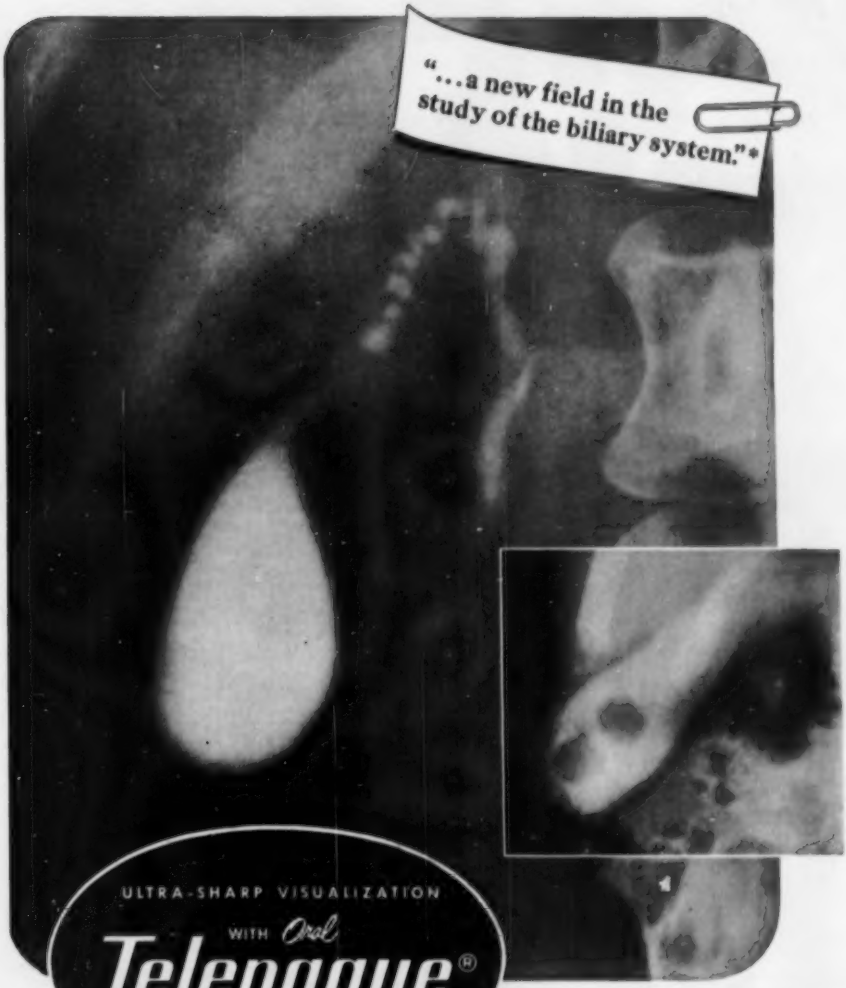

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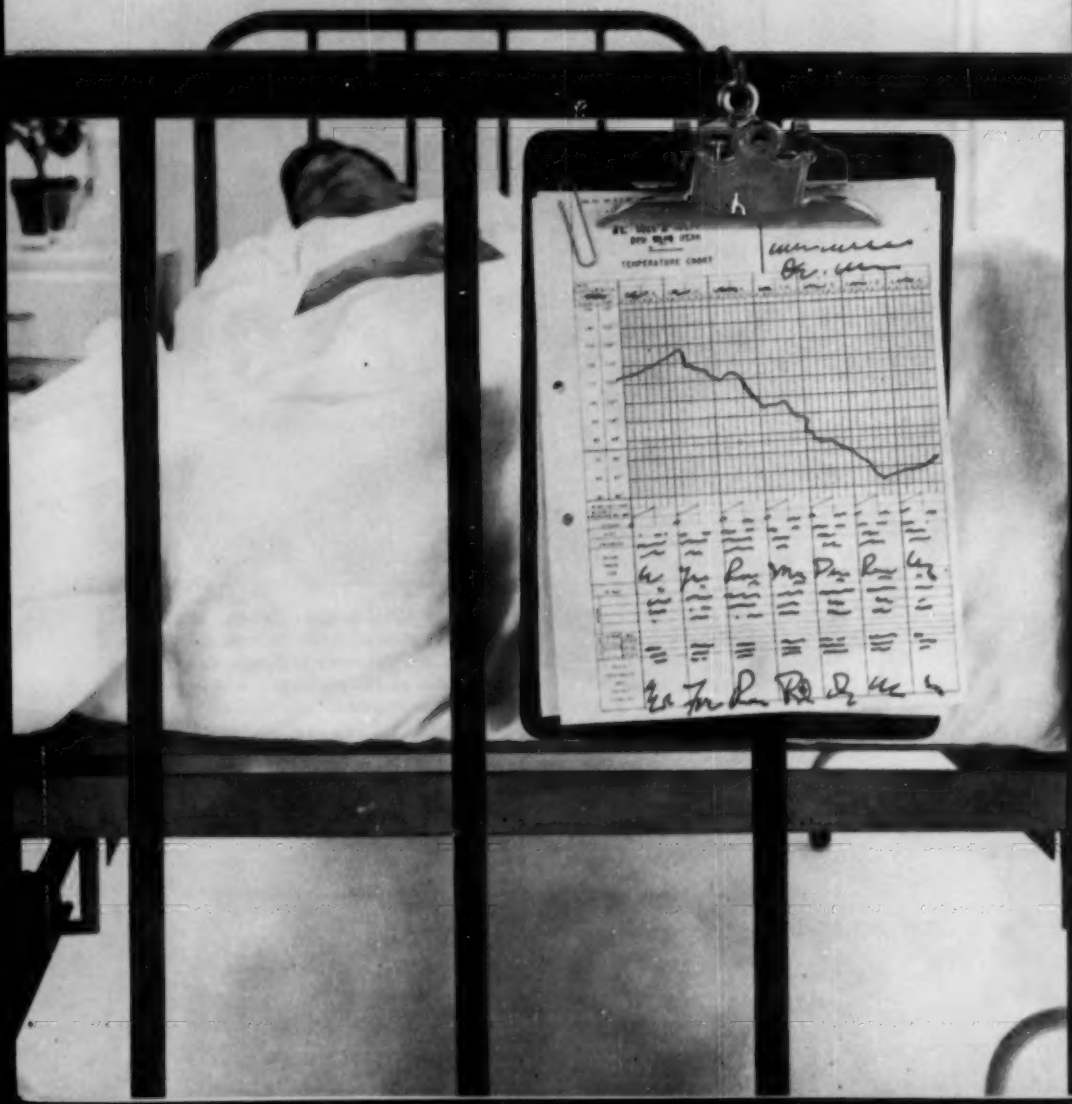

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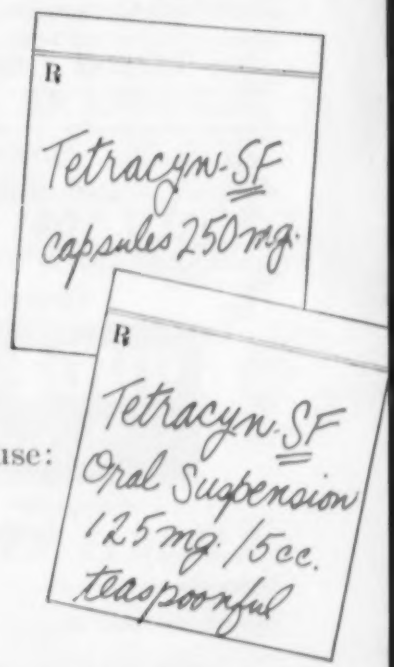

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1. Pollack, H., and Halpern, S. L.: Therapeutic Nutrition, Prepared in Collaboration with the Committee on Therapeutic Nutrition, Food and Nutrition Board, National Research Council, Washington, D. C., 1952.

2. Martí-Ibáñez, F.: Antibiotic Med. *1*:247 (May) 1955.

3. Dumas, K. J.: Carlozzi, M., and Wright, W. A.: Antibiotic Med. *1*:296 (May) 1955.

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Eighth International Conference of Social Work —August 5-10, 1956; Munich, Germany.

International Academy of Legal and Social Medicine—October 13-17; Genes, Italy.

International Anatomical Congress—July 25-30; Paris, France.

International Congress of Angiology and Histopathology — September 2-5; Fribourg, Switzerland.

International Congress of Biochemistry—August 1-6; Brussels, Belgium.

International Congress of Military Medicine and Pharmacy—August 28-September 1; Istanbul, Turkey.

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Pan American Congress on Rheumatic Disease —August 14-20; Rio de Janeiro and Sao Paulo, Brazil.

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1. Cass, L. J. and Frederik, W. S.: Malt Soup Extract as a Bowel Content Modifier in Geriatric Constipation. Journal-Lancet, 73:414 (Oct.) 1953.

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Economic Segregation in American Medicine

LYTT I. GARDNER

THE DEVELOPMENT OF FREE primary and secondary schools in the 19th century is a landmark in this country's progress toward equality of opportunity.[1, 2] The first half of the 20th century has seen an unprecedented flowering of institutions of the university level. Although many of our universities supported by public funds have charged low tuition fees, in general we have failed to apply the principle of free tuition to education beyond secondary schools. Further, tuition charges in American universities have shown a sharp increase in the past 20 years, aggravating the situation of young people from the middle and lower income groups who want a higher education. Thus the expensive nature of university-level undergraduate and graduate education represents a form of economic segregation inconsistent with our equalitarian ideals. Of all the branches of graduate education, medical schools are the greatest financial burden on the student. Here the adverse effects of the economic barrier are magnified. The high—and increasing—tuition fees of most medical schools in the United States impose a serious restriction on the free selection of potential physicians.

In a recent report data were presented which showed that the number of students applying to medical schools in the United States has been decreasing steadily over the past several years.[3] Increasing medical school tuition charges must be responsible in part for this phenomenon. Other contributing factors are the lowered birth rate of the depression years, which now shows up at the medical school level; the increased prestige and opportunities for students in other fields (e.g. engineering); the lag in awareness of potential students that the postwar congestion of medical schools is over; the influence of current controversies involving organized medicine on the motivation of potential students, and the effect on potential students of the disappearance of the "horse and buggy" doctor from the American scene.

The present paper would consider some aspects of the problem of tuition costs, both with respect to etiology and suggested therapy.

Data

Figure 1 contrasts the range of tuition charges (for state residents) in the state four-year medical schools of

Dr. Gardner is associate professor of pediatrics at the State University of New York Upstate Medical Center, Syracuse.

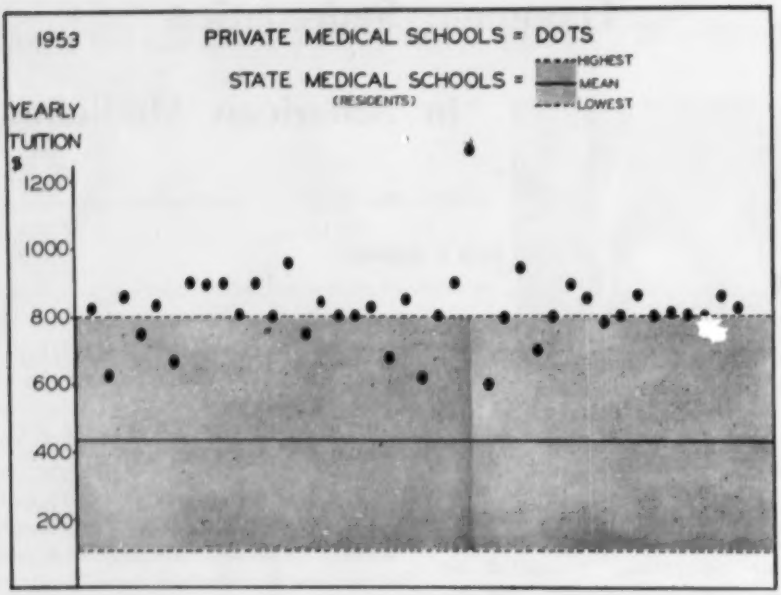

FIGURE 1

this country with the values for private medical schools. The data are for tuition and required fees for the year 1953.[4] The distribution of the private medical school tuition fees is notably centered about the upper limit of the state medical school tuition range. The highest value in the private school group is the College of Medical Evangelists, which is represented by the black dot near the top of the chart ($1,292 per year). The tuition figure for Howard University School of Medicine ($526.75 per year) was not charted in the private school group, since Howard University receives approximately 60 per cent of its funds through Congressional appropriation. From the budgetary point of view Howard comes close to being a "federal" medical school although it is now designated a private school. Data were not included on the four-year schools that were neither privately nor state-owned in 1953.*

It is believed that the cluster of private school fees at the $800 line represents no collusion, but rather an indication that the metabolic processes of private medical schools, like those of the human body, are governed by natural laws. The fees of these schools ranged nearer the $400 line 10 years ago, and now some are even higher than the 1953 figure.[5] This inexorable increase of tuition fees of our private medical schools is an ominous and worrisome fact. One does not have to extrapolate far into the future to see that a critical point must soon be reached, unless other methods of financing can be devised.

Figure 2 depicts tuition and required fees (for state residents) of state medical schools in this country for the years 1951 and 1953[6].[4] As shown in the first figure, the state

*University of Cincinnati College of Medicine; University of Louisville School of Medicine and Wayne University College of Medicine.

schools exhibit a much more marked disparity between the lowest and the highest tuition rates than do the private schools. Figure 2 shows that for the year 1953 there was nearly an eight-fold difference between the state medical school with lowest tuition (University of Texas School of Medicine, Galveston, $106 per year) and the highest (State University of New York Medical College at Syracuse, $800 per year). Since state medical schools have become increasingly insular, these tuition disparities confer financial disadvantages on students according

FIGURE 2

to entirely arbitrary, geographical lines.†

Figure 3 demonstrates how the inequities of this amorphous pattern of state medical school tuition fees may further be accentuated by differences in state per capita income. In this chart tuition and required fees of state four-year medical schools for the year 1951 were calculated as per cent of the per capita 1951 yearly income for all individuals of the given state.[7] Thus a citizen of Texas would have paid in 1951 only 7.5 per cent of the Texas per capita annual income to attend the Galveston unit of the University of Texas School of Medicine. At the other end of the scale a citizen of North Carolina would pay 57.9 per cent of his state's per capita annual income to attend its medical school in 1951. The extreme position of the latter state in this regard is noteworthy, and is obviously due to the combina-

†The extreme development of this trend is shown by the 1954 tuition data on the University of Colorado School of Medicine. The resident tuition and required fees are $525 per year, whereas the nonresident tuition and required fees are set at the astounding figure of $2,655 per year[5].

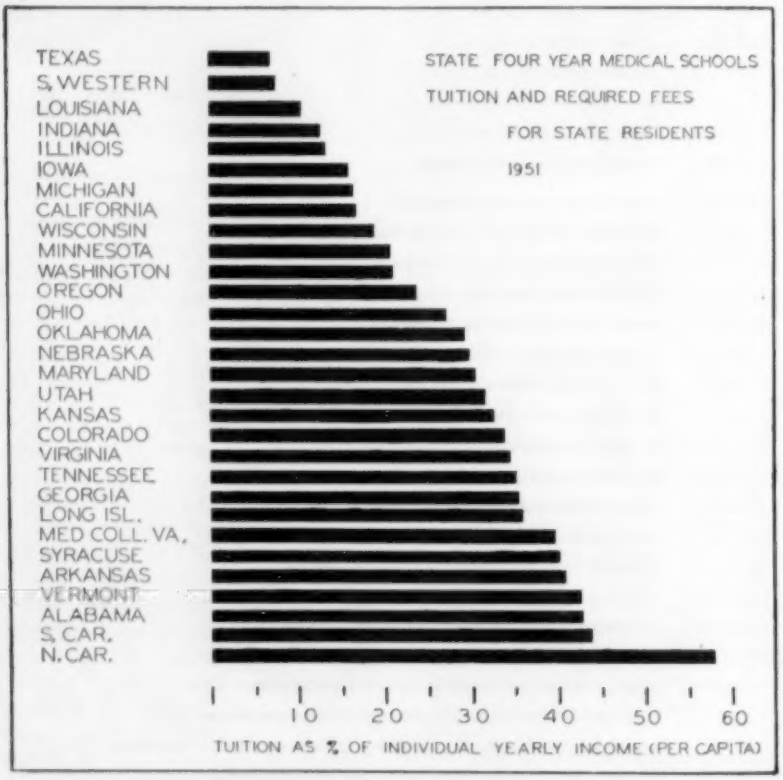

FIGURE 3. Differences in state per capita income levels further accentuate the inequities of state medical school tuition fees.

tion of relatively low per capita income and relatively high state medical school tuition. Fortunately the citizens of that state, both lay and professional, have shown their willingness to participate actively in health improvement efforts[8, 9] so that it would seem unlikely that this situation would long persist after the above information reaches responsible individuals.

Discussion

Plight of the private medical schools. The problem of student tuition cannot be separated from the problem of financing the private medical schools, since their financial problems have resulted in steady increases in the tuition it has been necessary for them to charge their students. The private schools depend upon tuition and fees for 27 per cent of their operating expenses, whereas this figure for publicly-supported schools is considerably lower (17 per cent).[11] The cost of medical education has risen as scientific improvements in medical care and medical teaching have developed. The basic operating expense of private medical schools increased 75 per cent between the fiscal years 1940-41 and 1947-48, yet these schools raised their tuition and fees per student only 29 per cent.[11] The medical schools of private universities now represent the most acute fiscal problem of these universities. The Commission on Financing in Higher Education recently found that most of the universities with medical schools had to allot 20 to 40 per cent of their instructional budget to their medical schools. This survey showed that medical students constituted only 2 to 14 per cent of the student body of these universities[13]. The financial stress of the private medical schools has produced several undesirable results, one of which is an unhealthy tendency to pyramid faculty structure on the shifting sands of research grant funds. This is particularly true in the private medical schools of the northeast and north central states with long histories of productive, creative research, which permits these schools to attract people of investigative inclination and in turn to obtain grants-in-aid to support them. This quantitative relationship has been most strikingly shown in graphic form by Reynolds and Price in their charts of "medical research potential" in geographic areas plotted against National Institutes of Health grants-in-aid for the same geographic areas.[14] The temptation of all medical schools, and especially private schools, to become involved in funds from research grants in an increasing fashion is understandable, since during the years 1920-1940 the rate of returns on invested funds diminished,[15] whereas the available funds of the Division of Research Grants and Fellowships of the National Institutes of Health alone increased from approximately $100,000 in 1938 to $12 million in 1949[14]. One of the complications which has arisen in institutions with extensive grant commitments is the cost of indirect expenses. The increased actual indirect cost above that percentage paid by grant funds for "overhead" has become an item of major concern in the fiscal pattern of large, private universities.[10, 11, 16]

It seems to this writer that one of the misconceptions in the public mind which most needs to be dispelled is the false idea that our great, privately-endowed university medical schools are "wealthy." They are "wealthy" in scholarly tradition, and presently, in faculty, but they are

dangerously financed, and the people should be aware of this. Some agonal assistance is being provided by The National Fund for Medical Education, which collected nearly $2,500,000 during 1953 from private industry and physicians to help all the medical schools of the country. Yet Dr. J. Howard Means, emeritus professor of medicine at Harvard, recently wrote:

> ". . . what actually is needed is $10,000,000. Without the larger figure deterioration in medical education is bound to occur—indeed it is already occurring to some degree. Unless private enterprise can raise four times more than it is raising at present, it would seem that some added support from tax money would be necessary if we are to maintain even present standards".[17]

Even the figure quoted by Dr. Means appears to be conservative, since in 1949 the Surgeon General's Committee on Medical School Grants and Finances estimated that an additional $40 million a year was needed in current operating funds for medical schools to perform their existing functions adequately.[11] All in all, until some solution for the financing of private medical schools in this country can be reached, there would seem to be little hope for doing anything about reducing the tuition charges of these schools.

Wide Variation

Inequities of state medical school tuition charges. In the group of state-supported medical schools there is wide variation in the tuition charged state residents, as previously noted in Figures 1 and 2. There appears to be no single factor which conditions the amount of tuition charged by this group of schools. It is regrettable that there has occurred a sharp rise in state medical school tuition charges since 1940-1941, for these schools do not have the same compelling financial reasons for increasing tuition charges as do the private schools.[11] The two state medical schools with highest tuition, the two medical school units of the State University of New York, hold this position because their charges for tuition and fees were carried over intact from their previous status as privately-endowed schools. This situation is particularly anomalous since certain other units of the State University of New York (e.g., the College of Forestry and the College of Veterinary Medicine) are tuition-free. However efforts are being made to alleviate this discrepancy[18], with a slight fee reduction in sight for the College of Medicine at Syracuse for 1954-55.

Contrary to the situation of the private schools, there is every reason to think that tuition charges in the state medical schools can be reduced, as a result of increasing public awareness of the dangers of economic selection of potential physicians. The President's Commission on Higher Education in 1947 gave a direct mandate to the publicly controlled institutions that fees be reduced:

> "The Commission is particularly concerned with the high charges assessed in certain professional schools operated under public control. . . It is recommended, therefore, that the publicly supported institutions maintain a fee beyond the fourteenth [second college] year adequate only to insure on the part of the student a sense of meaningful personal participation in the cost of his education".[19]

Yet the tuition charges described in Figure 2 far exceed such a goal.

Thus economic status presently must be a determining factor in the decision of many potential medical school applicants. This danger may be ultimately more harmful even than geographic or racial discrimination.[20] Enlightened public opinion ought to improve this situation, at least insofar as tax-supported medical schools are concerned. Our path has been clearly indicated by the 1947 Presidential Commission:

> "It is the responsibility of the community, at the local, state and national levels, to guarantee that financial barriers do not prevent any able and otherwise qualified young person from receiving the opportunity for higher education . . . The democratic community cannot tolerate a society based upon education for the well-to-do alone. If college opportunities are restricted to those in the higher income brackets, the way is open to the creation and perpetuation of a class society which has no place in the American way of life".[21]

Scholarships for the medical students from tax funds. The problem of the propriety of the entire scholarship approach to the financing of the education of young people in a democracy is a difficult one. Although at first glance one is likely to approve the concept of tax-supported scholarships for deserving students, there is more to the matter than meets the eye. If a democracy can afford to offer educational support to students, why need it do this by the indirection of a scholarship? The concept of state-awarded scholarships does not adapt gracefully to the American state university setting, since this creates a group of financially elite students whose tuitions are being sponsored by the state—the same state to whom the families of *all* the student body pay taxes. On the other hand if tuition is free students are closer to being on an equal financial basis. The writer submits that the latter system more nearly approaches the goal demanded by the American ideal.*

Federal Scholarships

From another direction there has arisen the proposal that a program of Federal scholarships be set up, under the aegis of the Department of Defense, to assure the military services of a steady supply of doctors. Such a program would exact military service from the individual in return for government-sponsorship of his medical education[23]. This plan has obvious appeal to the military, since it would do away with the unpopular doctors' draft, and at the same time endow the armed services with a "philanthropic" instrument.

It would be more in line with our democratic tradition to retain the present doctors' draft—unpopular though it may be—than to become involved in military support of medical tuitions. The Commission on Financing Higher Education commented in these words:

> "We also believe it undesirable for the government to expand the scope of its scholarship aid to individual students".[16]

Since in this country we have never before had the continuous threat of aggression as we now do, it behooves us to examine the experience of a country such as Germany in this matter of mixing medical education with military organizations on a long-term basis. For

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*The anatomy of the American *ethos* has been well described by the Swedish social economist, Gunnar Myrdal, in his chapter entitled "American Ideals and the American Conscience"[22].

this very purpose the *Friedrich-Wilhelms Institut* in Berlin was established in 1795, which provided free medical education to poor boys in return for later service as army doctors. The unpleasant aspects of this form of economic segregation of medical students, together with progressive encroachment of the army on civilian medicine in general, resulted in public demands in 1848 by the father of modern pathology, Rudolf Virchow, for abolition of the German special military medical schools and for a program to reduce the medical privileges of the army.[24] This represents an extreme development of military interference, which would seem unlikely in our nation with its citizen's army tradition. Yet the lesson of history must be learned repeatedly.

Conclusions

This is a study of one of the probable reasons for the decrease in medical school applications—the rise in medical school tuition charges. Graphic data have been presented which demonstrate the high tuition charges of our private and state medical schools, and the extremely wide range of tuition charges in the state medical schools. One chart equates state medical school tuition charges with per capita state income.

The increased tuition in the private schools is believed to be related to the financial stringencies under which these schools are now operating. Assistance from tax funds would appear to be a necessity for the survival of these schools if present trends continue. Therefore, increased efforts need to be made to explore the difficulties inherent in such financing in this country. Two large factors complicate this picture: on one hand the reluctance of private educators to accept directly allocated tax funds, especially Federal funds,[16] and on the other hand the necessity that the expenditure of public funds be made in accordance with the protective requirements of our democracy. Whereas it would be deplorable for the structure of our great private medical schools to be eroded further due to lack of funds, it would be just as hazardous for a Topsy-like, unplanned scheme of financing from tax funds to develop.

The writer proposes that a governmental fact-finding commission be constituted specifically for the purposes of: (a) assessing the attitudes of private university officials in relation to the financing of their medical schools from tax funds, (b) devising suggested programs of direct tax support for such schools which would protect the constitutional rights of taxpayers and (c) reviewing the experience of other countries in this problem, to see if any pitfalls can thus be avoided. Considerable data are already available in connection with the latter task.[25]

The existence of state-supported medical schools with relatively high tuition charges probably indicates a lack of public awareness of the hazards inherent in economic selection of potential physicians. Federal or state scholarships for medical students in state medical schools do not seem to be a democratic solution to the problem. The writer believes that the people of this country, once the evolutionary processes of public argumentation in a free press have taken place, will underwrite the principle of free state university and professional school education. The concept of free medical education was proposed by Rudolf Virchow over a hundred years ago[26]. In his country Virchow also was a staunch

(and unsuccessful) advocate of free public schools—an institution that we now perhaps take too much for granted in the United States.[27]

Our great-grandfathers removed the threat of economic segregation from early education when the American free public school system was established. It is for us to lower the economic barriers to higher education by establishing the principle of free tuition in our publicly-supported universities, including the medical school units.

REFERENCES

1. CUBBERLEY, E. P.: "Public Education in the United States." Houghton Mifflin Co., Boston, Mass., 1934, 782 pp.

2. KNIGHT, E. W. (editor): "A Documentary History of Education in the South Before 1860," Vols. I-V. University of North Carolina Press, Chapel Hill, N. C., 1949-1953, 3004 pp.

3. STALNAKER, J. M.: "The Study of Applicants for Admission to U.S. Medical Colleges, Class Entering in 1953-1954," *J. Med. Educ. 29*:13-20, 1954.

4. STALNAKER, J. M. and EINDHOVEN, J.: "Admission Requirements of American Medical Colleges." Association of American Medical Colleges, Chicago, Ill. 1953 Student Edition.

5. STALNAKER, J. M. and EINDHOVEN, J.: *Ibid.* 1954 Student Edition.

6. STALNAKER, J. M. and EINDHOVEN, J.: *Ibid.* 1951 Student Edition.

7. United States Department of Commerce, statistics for 1951. Quoted by The World Almanac, published by the New York World-Telegram, New York, N. Y., 1954, p. 743.

8. American Academy of Pediatrics and the Commonwealth Fund, "Supplement to Child Health Services and Pediatric Education," The Commonwealth Fund, New York, N. Y., 1949.

9. GARDNER, L. I.: "A Brief History of the North Carolina Medical Care Commission," *Pediatrics 13*:89-91, 1954.

10. "Medical School Grants and Finances," A Report by the Surgeon General's Committee on Medical School Grants and Finances. Part I. Conclusions and Recommendations, Public Health Service Publication No. 53, U.S. Government Printing Office, Washington, D. C., 1951, 48 pp.

11. *Ibid.* Part II. "Financial Status and Needs of Medical Schools," Public Health Service Publication No. 54, 1951, 85 pp.

12. *Ibid.* Part III. "Public Health Service Grants, Their Distribution and Impact on Medical Schools," Public Health Service Publication No. 55, 1951, 58 pp.

13. MILLETT, JOHN D.: "Financing Higher Education in the United States," The Staff Report of the Commission on Financing Higher Education, sponsored by the Association of American Universities. Columbia University Press, New York, N. Y., 1952, 544 pp.

14. REYNOLDS, FRANK W. and PRICE, DAVID E.: "Federal Support of Medical Research Through the Public Health Service," *Am. Scientist 37*:578-586, 1949.

15. "Higher Education for American Democracy," A Report of The President's Commission on Higher Education. Vol. V. Financing Higher Education, U.S. Government Printing Office, Washington, D. C., December 1947, p. 31.

16. "Nature and Needs of Higher Education," The Report of the Commission on Financing Higher Education, sponsored by the Association of American Universities. Columbia University Press, New York, N. Y., 1952, 150 pp.

17. MEANS, J. HOWARD: "Support for Medical Education," Letter to the Editor, *The New York Times*, June 25, 1954.

18. HESSE, FRANK: "What Price Glory!" editorial, *The Speculum, 1*:2-3 (No. 2), 1954 (quarterly student publication of the Upstate Medical Center, State U. of N. Y.).

19. Higher Education for American Democracy. Vol. V. *op. cit.* pp. 3-4.

20. FINE, BENJAMIN: "Our Medical Schools Today," *Med. Econ.* October, 1953, p. 112.

21. Higher Education for American Democracy. *op. cit.* Vol. II. "Equalizing and Expanding Individual Opportunity, Chap. II. The Economic Barrier, p. 23.

22. MYRDAL, GUNNAR: "An American Dilemma," Harper & Brothers, New York, 1944, 1483 pp.

23. "Services Set Plan to Train Doctors," news release from the Department of Defense, *The New York Times*, datelined November 17, 1953.

24. ACKERKNECHT, E. H.: "Rudolf Virchow, Doctor — Statesman — Anthropologist," The University of Wisconsin Press, Madison, Wisc., 1953, p. 141.

25. DODDS, H. W., HACKER, L. M. and ROGERS, L.: "Government Assistance to Universities in Great Britain," Memoranda submitted to the Commission on Financing Higher Education. Published by the Columbia University Press, New York, N. Y., 1952, 140 pp.

26. ACKERKNECHT, E. H.: *op. cit.*, p. 143.

27. ROGERS, VIRGIL M.: "Can America Lose Her Free Public Schools? The J. Richard Street Lecture at Syracuse University. Published by the Syracuse University Press, Syracuse, N. Y., 1954, 31 pp.

Clinical Clerkships

CLINICAL CLERK: The clinical clerk as a potent factor in surgical teaching is becoming more and more generally recognized and employed. This has long been the method of teaching in England. It seems to offer the best possible manner of bringing the student in actual contact with surgical cases in a way that is not obnoxious to the patient, to the instructor, to the hospital nor to the student. By clinical clerkships is understood a group of two or more students who are assigned to a case after it enters the hospital and who study the case as their own until the course of the disease is finished . . . He [clerk] should be given the widest field possible for speculation and original thought under proper guidance, and should be made to report a logical conclusion based on his findings in the case, his study of the literature and his speculation."—A. C. STOKES, M.D., *University of Nebraska, in an address before the 26th Annual Meeting of the AAMC, Chicago, February 1916.*

Predicting Academic Success Through Achievement and Aptitude Tests

ROBERT I. WATSON

AT THE PRESENT time all medical schools in the United States have available for their use the results of the Medical College Admission Tests. In varying degrees, admissions committees use these scores in selecting their classes in conjunction with other relevant information such as college grades and premedical faculty recommendations. It is of some interest, therefore, to present evidence concerning the value of this test in predicting medical school success throughout the four undergraduate medical school years. The relevance of the particular findings for this purpose is heightened by the fact that results on a local test battery, administered after selection, are available for comparison.

The Subjects

The subjects for this study were the members of the class of 1951 who entered Washington University Medical School in September 1947. Of the 86 freshmen, 81 completed the year. Four others did not graduate in 1951 with their class. On entry the mean age of the class was 23.07 years. Eight of the group were women. Thirty-three schools were represented. Junior transfer students were not included in the study.

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The Predictor Variables

The tests used to predict the criterion of grades achieved will be described. The Professional Aptitude Test, now called the Medical College Admission Test, yields several scores. The Index of General Ability, hereafter referred to as the aptitude score, is a combination of verbal ability scores (scientific, social and humanistic) and a score on quantitative ability. Within this composite the components are given rough weights of three for the verbal component and one for the quantitative. The Premedical Science Achievement Score, hereafter referred to as the achievement score, is a composite measure of achievement in chemistry, biology and physics.

One of the locally administered tests used in this study as a predictor variable is the I.E.R. Intelligence Scale CAVD. It is utilized at this medical school because at the upper levels of intellectual ability it is one of the most difficult of available tests and, therefore, is suitable for a medical school class which has already been rigidly screened for high ability. Thorndike designed it primarily as a measure of the altitude of intellect; i.e., the level of difficulty at which the subject could function effectively. Divided as it is over 17 levels of performance, A through Q inclusive, only two levels, O and

P, were used in this study. In both levels O and P there are 40 items, making 10 for each of the subtests. These subtests are identified by their initial letters, namely, CAVD.

Paraphrasing Thorndike's explanation of the four designations, *C*, or *Sentence Completion* is designed to tap the ability of the subject to supply words that make an incomplete statement correct and sensible. The second subtest, *A, Arithmetic Problems,* is self-explanatory. The third subtest, *V,* or *Vocabulary,* is aimed at measuring the subject's ability to understand words. The fourth subtest, *D,* or *Following Directions,* is designed to measure the subject's ability to understand connected discourse in the form of paragraphs about which he is asked certain questions.

No time limits are applied, thus making the CAVD free from the effects of speed. This, of course, contributes to its value as a measure of altitude and to the sheer difficulty of items that can be correctly answered. Two to four hours were taken by the students for this test. The score used consisted of the sum of correct responses for combined levels O and P.

The cooperative Zoology Test, Form 1936, was also used as a predictor variable. This is an achievement test in zoology. The sections given are devoted to selection of facts and publication of principles, and they required 105 minutes of working time.

The Cooperative General Chemistry Test for college students, Form 1946, also included, is a measure of knowledge of chemistry. It samples general knowledge and information, application of principles, scientific method and knowledge of laboratory technique and procedures. The time allowed was 110 minutes.

The Minnesota Reading Examination for College Students, Form A, was the last of the tests used as a predictor. Part 2, Paragraph Reading, was the section used, taking 40 minutes of working time. It requires the student to read a series of paragraphs and then answer questions about what he has read.

Several other tests are given as part of the battery but are not used as predictors. The Wonderlic personnel test, which was included in the battery, had a range of 11 from lowest to highest score and correlated nonsignificantly with grades. The Strong Vocational Interest Blank and the Minnesota Personality Scale also are part of the battery but are not considered here because they are not achievement or aptitude tests.

The Criterion

The criterion used in this study was grade achievement. The weighted grades for each of the years and the weighted composite grade for the four academic years were derived. Each department reported grades in the form of numerical ranks, with the highest man receiving a rank of one. The ranks for each subject were converted into normally distributed numerical grades with passing at 70, the mean at about 83.5, and a standard deviation of about 6.00. The year's grade was derived by a weighting based upon the number of class hours devoted to each of the subjects. In arriving at the class standing, the custom is to weight a subject three, two, one and one-half, or one according to this principle. For example, in the freshman year gross anatomy, biochemistry and physiology were weighted two, while neurology and histology were weighted one. Class rank is obtained by adding the ranks weighted in this fashion which are then divided by

the sum of the weights. The year ranks, in turn, were converted to numerical grades.

The criterion of academic success, although often used in such studies as this, is, nonetheless, a limited and intermediate criterion. The ultimate criterion one would like to use is some measure of success in professional life. The feeling of frustration engendered by the use of school success as the criterion is tempered somewhat by the realization that failure to graduate certainly prevents entry into the profession.

Results

For the majority of subjects PAT scores were available, but for others they were not. This lack of PAT scores for some created a situation in which a decision had to be made as to what results to report—only for subjects on whom PAT scores were available or for the entire group of subjects. It was decided to calculate for the other predictor variables, the correlations, the means and the standard deviations separately for the non-PAT and PAT groups. Application of statistical measures apropriate to test the null hypothesis; i.e., that there is no significant difference between the groups, was carried out and no significant differences found. Consequently, for the results to be reported, the total sample available will be used insofar as tests other than PAT are concerned.

In Table 1 are presented the correlations between the average weighted grades and the predictor tests year by year and for the four years combined. In the case of the achievement and aptitude sections of the PAT, the number of subjects for the first year was 57 and for the second and subsequent years it was 54. For the other tests there were 81 freshmen subjects and 77 thereafter. Using conventional but rigorous statistical technique, it is necessary to obtain for these varying sample sizes, correlations of from .29 to .35, in order to be able to conclude with a high degree of confidence (at the .01* level) that the obtained value for the correlation is likely to be greater than zero. Four tests, PAT Aptitude, PAT Achievement, Coop. Chemistry and Coop. Zoology achieved this level of significance at almost all class year levels. In the first year these four tests correlated with grades to the extent of .44 to .50. In the second and third years, for these same tests, the range of the correlations with grades was from .32 to .42. For the fourth school year it would appear that aptitude and achievement held up (.37 and .36 respectively) while chemis-

TABLE 1

The Correlation between the Average Weighted Grades by Year and the Predictor Tests

Year	PAT Apt.	PAT Achiev.	Coop. Chem.	Coop. Zool.	Minn. Read.	CAVD
1	.44	.45	.50	.49	.29	.29
2	.34	.32	.31	.42	.03	.11
3	.38	.36	.32	.36	.01	.14
4	.37	.36	.11	.15	.06	.05
All	.27	.33	.28	.30	.03	.07

TABLE 2

Correlation of PAT Aptitude and Achievement Scores with those of the Locally Administered Battery

	Coop. Chem.	Coop. Zool.	CAVD	Minn. Read.
PAT Aptitude	.59	.54	.75	.47
PAT Achievement	.81	.65	.38	.27

try and zoology did not (.11 and .15). For the combined four year,weighted grade all tests were significantly related to grades at about the same level since the correlations ranged from .27 to .33 Although almost reaching statistical significance for the first year, the reading and CAVD tests were, in subsequent years, nonpredictive.

The problem now arises as to whether or not the first four tests found singly to be significantly related to grades are in combination even more predictive. The investigation of this point is carried out by calculation of multiple correlations, in which two or more predictor variables are used as a team, as it were. For 54 subjects the Achievement and Aptitude scores of the PAT used to predict grades for the four years gave a multiple correlation of .34. This may be compared with the correlation of .33 when achievement alone is used. This best pair in prediction, consisting of PAT Achievement and Coop. Zoology, yielded a multiple correlation with grades for the four years of .36. Adding a third test variable to this pair, such as Coop. Chemistry, likewise yielded a multiple correlation of .36.

It is readily apparent that use of two or more tests does not improve prediction significantly over that obtained from one test alone. This failure of multiple correlation to increase prediction is due in large measure to the high degree of relationship between PAT Achievement and Aptitude scores to the scores obtained on the other tests. Table 2 reports these correlations for 57 subjects. The correlation between Coop. Chemistry and PAT Achievement of .81 and that between PAT Aptitude and CAVD of .75 are the two highest coefficients obtained. Such degrees of relationship would foretell the negligible increase found through multiple correlation.

The median of the correlations reported in Table 1 for PAT Aptitude, PAT Achievement, Coop. Chemistry, and Coop. Zoology, is .35. The largest correlation, that between first year grades and Coop. Chemistry, is .50.

TABLE 3

Percentile Positions of Students Eliminated for Academic Deficiency

Percentile Position	PAT Apt.	PAT Achiev.	Coop. Chem.	Coop. Zool.	CAVD	Minn. Reading
1-25	3	3	5	5	4	3
26-50	0	3	2	3	2	4
51-75	3	1	3	1	1	3
76-100	1	0	1	2	4	1

For summarizing these results, these values may be used as representative of the findings in general. These two correlations, like the others, can be interpreted in terms of coefficients of forecasting efficiency (E). In the first instance E = .06 and, in the second E = .13. In effect, this means that the test's efficiency in predicting the criterion is 6 and 13 per cent respectively, leaving a large remainder unpredicted in each instance.

It is of some interest to examine the scores of those 14 individuals who did not graduate with their class. This group is heterogeneous in that the reasons vary for their failure to graduate in 1951. One student with an excellent record chose to spend two years in research on completion of the first two academic years. Another, although doing good academic work, quite calmly and rationally decided that another field held greater attraction and withdrew from medical school. Still another, although doing excellent work, experienced severe emotional difficulties requiring hospitalization. The remaining 11 students at the time they were dropped from medical school were in academic difficulties. Although this was the common denominator, nevertheless, in varying degrees factors other than past achievement and aptitude for medical school complicated the picture. Often this took the form of emotional difficulties which present predictor variables could hardly be expected to detect. In spite of this complication running as a thread of uncertainty throughout the finding, it was decided that it was the scores of these 11 individuals which should be compared with those of students who successfully completed medical school. Table 3 presents the results in terms of percentile positions occupied by the failing students divided into quartiles for the entire class. Using PAT Aptitude scores as an illustration, three students were in the lowest quartile, three in the third quartile, and one in the top quartile. Although naturally the distribution of scores varies from test to test, no definite trend is discernible. In every instance at least half of the test scores of those eliminated were above the lowest quartile. With 22 of the 86 students in the lowest quartile, the most that could have been detected as failures by any one test was five (with either Coop. Chemistry or Coop. Zoology). If a cutting score had been made at a point, equivalent to a score at the twenty-fifth percentile, 17 others who completed medical school successfully would have been eliminated as well as these five.

It would have been worthwhile to compare as predictor variables these tests with college grades used as predictors. At present, since the proper weights to take into account variability in grading systems in the approximately 35 schools represented in a typical freshman class are lacking, it is necessary to be content with the correlation between average weighted grades in medical school year by year. The results obtained with 72 members of this class are reported in Table 4. Freshman grades correlate .71, .56, and .62 with second, third and fourth year grades. The

TABLE 4

The Correlation between Average Weighted Grades by Medical School Year

Year	Year 2	3	4
1	.71	.56	.62
2	0	.76	.66
3	0	0	.68

correlations among the other years are of similar magnitude. The highest correlation, that of .76 between second and third year grades, is of interest because of the belief apparently widely held by medical students that after the basic science years there is a realignment of grades in the clinical years so that those who did poor or mediocre work now blossom forth. These correlations scarcely lend credence to this bit of wishful thinking.

Discussion of Results

Stalnaker[1] in an authoritative statement concerning the Medical College Admission Test, illustrates very admirably the point that this test should be used for its intrinsic value, instead of merely with hopes that grades will be predicted. Nevertheless, the magnitude and nature of its predictive efficiency is a proper subject of investigation.

The magnitude of a correlation determines the degree of accuracy of prediction. The very small coefficients of forecasting efficiency and the failure to improve prediction by multiple correlation show there must be important factors at work other than aptitude and achievement as measured by these tests so far as progress in medical school is concerned. Effort, interest, ability and past achievement as judged other than by tests, all must be taken into consideration both in evaluation for admission and in consideration of medical school achievement. The caution given earlier concerning the partial and incomplete nature of the present criterion of grades is also pertinent. The nature and degree of student-instructor relationships, the living arrangements of the student, the amount of study, the efficiency of the study and the academic goals set by the student whether these be low or high are other factors at work.

Although this is "one more paper" concerned with the relationship of intellectual factors to medical school success, the writer is convinced that the nonintellectual area holds more promise in accounting for achievement in medical school. Actually, however, identification of pertinent factors through research as distinguished from such "clinically derived" speculation as this is only at its barest beginnings in medical student selection and prediction of academic success. Few factors associated with academic success have yet been teased from this matrix of interrelationships.

The PAT was a basis of selection of the medical school class under consideration. When test scores are used to aid in selecting a small group from a much larger group, their potentialities for predicting success are considerably lessened. In fact, to bring out clearly a test's efficacy in selection would require that selection be made without recourse to the test scores, and then to study the correlation with the criterion. Such a study, although admirable in intent, is hardly likely to have much appeal for a medical school administrator. The locally administered battery was, with three or four exceptions, administered after selection. There was an opportunity for its predictive efficiency to be studied in a situation in which it was not hampered by prior use in selection In use for some years before the appearance of the PAT, this local battery was, in the judgement of the writer, the most suitable achievement and aptitude battery that could be obtained for prediction of academic success.

It is evident, from the findings concerning relative predictive efficiency

of the PAT and the local battery given in the section of this paper on results, that the PAT and elements of the local battery are numerically equally predictive. However, since the former was used in selection and the latter were not, the PAT is remarkably efficient in prediction as compared to the local battery, considering the handicap of its use in selection. The high correlation between PAT and the local battery demonstrates there is little chance that use of the local battery in selection would make for more efficient selection.

The relationships reported here are undoubtedly lower than might otherwise be the case. If the assumption be made that the applicants applying to Washington University are a random sample of the nationwide applicant population, then selection results in a considerable restriction of range, as exemplified by the very small percentage accepted whose scores fell below the nationwide applicant mean of 500 on the PAT. Thus, in effect, about 50 per cent of the applicant population was eliminated with this device alone. To be sure, actual calculation might change the approximate percentage slightly but not the fact that applicants falling in the lower half of the distribution are rejected almost completely. Intensive study of applicants showed that in some instances the possessed characteristics which would compensate for lower test scores. This also served to lower the coefficients. Similarly, the efforts both on the part of faculty and dean's office directed toward keeping in school as many of the students as possible, commensurate with maintenance of standards, presumably had a depressing effect on the obtained correlations.

The year of entry of this class into medical school was the first year that the results of the new admission tests were available. The results, although consulted, were not weighted heavily in the selection procedure. In subsequent years they have been more heavily relied upon. Consequently, in later years, with heavier weighting to the findings and with at least the possibility of more adroit use of other data to identify those individuals scoring low in tests, in which the scores do *not* predict accurately their future success, it is reasonable to believe that the correlational findings will change somewhat. It is also quite conceivable that these two major trends (greater utilization and more adroit ways of picking exceptions) act in such fashion as to cancel one another. In any case the caution must be offered that conceivably the results might be different in other years.

Certainly in other schools the correlation between grades and tests and the relationship between scores and elimination could be expected to vary from those herein reported. It is urged that steps be taken by each school to find out for their local setting the nature and degree of relationship obtaining.

The use of a locally administered test battery *after* selection raises the question of the usefulness of these results in selection. After all, the student is in good standing and will not be dropped without justification so a poor showing on these tests, as such, is certainly no grounds for such action. Although the correlations obtained with the locally administered battery do not increase prediction, this does not mean the results are without value. As described elsewhere [2], for guidance and administrative purposes they have proven exceedingly helpful. In addition, the fact that the tests are routinely given

to the entire class on entry does not prevent their being used in individual cases *before* acceptance. Occasionally, some question will arise about the validity of the results of the Medical College Admission Tests. The student might have been ill or under unusual stress at the time he took the selection battery and these circumstances should be considered during deliberations of the admissions committee. In spite of the fact that local experience has corroborated the results of the MCAT in most instances, both public relations and the peace of mind of the admission committee have been served by having available a battery of tests with a known correlation to grades and to the MCAT itself.

Turning to consideration of the scores obtained by the students eliminated for academic deficiency, it appears that selection would not be improved by eliminating those with relatively low scores. The large number of students successfully completing the four years, who made comparable low scores, is evidence for this contention. It must be emphasized, however, that this holds, so far as is known, only with the present standards of selection and in the local setting. If the standards were lowered it might well be that those at the lower limits would show a preponderance of academic failures.

It is evident from correlation of freshman grades with those for the later years that prediction of grades after the first year is more precise when freshman grades are used as a predictor than when a test, or combination of tests, is used. Presumably this greater efficiency of grades to predict later grades is due to the fact that they measure something other than what the present ability and achievement tests manage to tap. This comment is not meant to imply that tests are necessarily less useful than grades. Obviously freshman grades in medical school are not available when selecting freshmen and performance tests must perforce still be used.

Conclusions

1. An earlier version of the Medical College Admission Test, the Professional Aptitude Test, correlates only moderately with grades achieved in medical school for the one class studied.

2. Neither elements of a locally administered battery of tests nor combinations of these tests with the Professional Aptitude Test significantly increases accuracy of prediction over the level achieved by tests used singly.

3. Students dropped for academic deficiency (11 from a class of 86) cannot be distinguished on the basis of the magnitude of their test scores from those successfully completing the medical school curriculum.

4. After the freshman year the best predictor studied of subsequent medical school success was freshman year grades.

5. Factors other than those measured by achievement and aptitude tests are of importance in predicting medical school success when this is measured even by the criterion of grades achieved.

6. The Professional Aptitude Test (MCAT) and the locally administered battery possess considerable value in selection.

BIBLIOGRAPHY

1. Stalnaker, J. M.: "Medical College Admission Test," *J. Assoc. Amer. Med. Coll.*, 1950, *25:* 428-434.

2. Watson, R. I.: "Counseling Activities in a Medical School Setting," *J. Med. Educ.*, 1953, *28*, 23-30.

A Course on Factors Influencing Scientific Judgment

M. L. JOHNSON

ABOUT SIX YEARS AGO we set out to tackle some of the difficulties of medical education which cluster around what is often called "learning to think" as distinguished from "learning the facts." A course consisting of eight discussions has taken a shape which, though unorthodox, is fairly well-defined and, we think, promising.

The results of a preliminary testing of the effects of the course on one of the skills we are trying to train—observation—are encouraging. We found that students who had taken the course did significantly better in an observation test than those who had not. The experiment however, needs repeating, and we need to test the efficacy of the course in training other skills beside observation.

A good reason for accepting this invitation is that the origin and development of the project owes so much to American colleagues, and that the ideas I have should be offered for reexport before they ossify. In the first place, the work was made possible by the generosity of the Rockefeller Foundation, and secondly, its development has been much influenced by certain ways of thinking in America, some of which can be specified, many of which can be only vaguely ascribed to the catalytic effects of conversations with your wandering ambassadors of science or to browsings in your literature.

I find it most convenient to think of this course as introducing students to some of the factors which influence their own judgments on scientific matters. In order to avoid misunderstandings that may arise as a result of prematurely categorizing the course as being one on psychology, scientific method or logic, I will recall that we took as our text a statement made by a committee of the Royal College of Physicians. The average medical graduate "tends to lack curiosity and initiative; his powers of observation are relatively undeveloped; his ability to arrange and interpret facts is poor; he lacks precision in the use of words."[1]

Our aim to forestall these deficiencies ties the course down to some of the everyday intellectual problems involved in the work of a student and future doctor, and however much we may get tangled up with psychology or other recognized disciplines, we make no attempt at the systematic study of them.

The course is taken in the first year of preclinical studies (anatomy, physiology and pharmacology). Most of the students have just come up to the university, having completed their

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premedical science courses at school, and some will already have had a year at the university in the premedical sciences. The majority are between 18 and 20 years old.

Eight Discussions

The course consists of eight weekly discussions, each lasting 1¾ hours. Students attend these in groups of 12; it happens that this is a convenient number—it is not necessarily the optimum.

The topic of discussion is provided in most cases by an exercise at which the students work individually for 20 minutes. The exercises are chosen to illustrate some problems of observation, or use of language or evaluation of evidence, and the problems are presented in a form not unlike that in which they may be met by the student during the ordinary course of his work.

After doing the exercise the students talk about it informally. It soon becomes clear that they have reacted variously to it and they compare and contrast the different statements and their implications. At the end of an hour's discussion we have usually arrived at a fairly acceptable answer to the problem. This, however, is not our major aim—it could be achieved much more quickly and easily by correcting and explaining mistakes, as is usually done in tutorial classes. The aim of these discussions is to uncover some of the factors that have influenced the student's reactions to the exercise. In discussion they can see how any judgment, often made in an intuitive flash, has been determined by a multitude of interacting factors. At the moment of making the judgment the subject is usually unaware of many of these factors, so that the validity of their contribution to it has not been examined and questioned. By continuous comparison and contrast of the statements made by different participants in discussion we can expose some of these factors and are then able to test their usefulness.

Some of the factors are related to what we can call the "immediate situation." In such cases a student would react differently to the same exercise if certain features of the presentation were altered. For example, during part of the exercise preceding the fourth discussion students are asked to give all the meanings of the word "normal" they can think of. It is common for them to give meanings related to the anatomical and physiological uses of the word, but they often omit the chemical or physical meanings, though they recall these very easily when they are mentioned. They may explain their omission by saying that they "just didn't think of them," or "thought they weren't wanted." It has even happened that a student wrote them all down and then crossed them out, as though he had been unable to take in the "all" in the question, so narrowly prescribed was his notion of what is appropriate in an anatomy department.

The aim of exposing such reactions is not just to show how commonly students "don't read the question," or "don't understand it properly," but *why* they interpret it in one way rather than another. In this way we try to get what Bertrand Russell has called "emancipation from the tyranny of the here and now" by seeing how much our behavior is controlled by such factors which do not always help us to make the most useful response.

Besides such trivial circumstantial and relatively labile factors connected with the immediate situation, other determinants of behavior are revealed which are deeply rooted in the per-

sonality of the student, and are expressions of his basic attitude toward life; in this category are some of the patterns of thinking discussed by Adorno et al.[2] We find that judgments on scientific matters are affected, for instance, by such intangible factors as a predisposition to feel that people either must be trusted or cannot be trusted. When a student recognizes the effects of such a basic attitude and entertains the possibility of modifying it, we are getting pretty near to the kind of changes that are aimed at in psychotherapy.

We do not concentrate on errors of judgment only, but examine equally the useful and the not-so-useful responses, both the sensible responses and those which seem in retrospect, or by comparison with those of others, silly and irrational, are by no means random or undirected but have been determined by a tangle of interacting factors ranging from trivial details of the present situation to basic assumptions about human behavior.

We hope that as we become aware of these determinants we can control them, thus making our judgments more "objective." The method of conducting the discussion is naturally dictated by this aim. The amount I actually say varies with the group and fluctuates from one discussion to another. I seldom say much more than the most vocal student member of the group, and often far less. A considerable range of behavior is not only tolerated but encouraged. We do not aim to have well-formulated speeches, but expect quite a lot of the conversation to be, as ordinary conversation is, rather incoherent and interrupted by interjections.

Occasionally, and never for long, two or more subgroups may form, holding separate conversations concurrently; or one person may be ruminating alone, grinding out his words. It is sometimes salutary for a group to listen to a tape recording of another discussion, so that they can see that alternative patterns of behavior are possible. For instance an inhibited group may talk more freely after listening to a more volatile group.

Teacher's Role

My role as a teacher in these classes is a rather peculiar one for I avoid telling the students what they ought to have done. The development of my technique owes a great deal to Dr. S. H. Foulkes[3] and his associates, for some understanding of the problems of group analytic psychotherapy is of great assistance in conducting discussion groups. I regard my main job as establishing and maintaining "free floating security"—if I may borrow a pregnant phrase from Dr. Frank Fremont Smith—which helps students to adjust to this unfamiliar and often difficult situation.

The very freedom which is essential for the exploration of ideas is frightening to some people; a few feel that it is dangerous to talk spontaneously. I think one of the most helpful things is to try to indicate the relation of apparently unrelated statements. The subjects referred to in discussion cover a wide range from Mendeleef's Table to the color of buses, from Einstein's questioning of Newtonian physics to the effect of the London dock strike on the price of eggs. It is not surprising that a topic which seems vital to one participant is just a red herring to another until its significance to the main theme is pointed out. The aim is to try to replace the security of thinking in well-defined, familiar channels with a new kind of security based on the acceptance of ambiguity, uncertainty and open choice.

Care is taken also to link up the discussions, and to show the series as an integrated one, despite the fact that there is considerable variety in the topics with which each discussion begins. The course starts with a familiar type of exercise and ends with a discussion devoted entirely to rounding off the series. As long and carefully planned speeches are inappropriate in the setting, I find it useful to ask students to read a short article after the second discussion, and another before the last, in which I have attempted to make the aims and techniques of the course more explicit. In such ways deliberate efforts are made to make patent a useful pattern in what might otherwise seem meaningless chaos.

The outline of the course is as follows. The first three discussions are concerned with how we make judgments on information received visually.

1. *Observation (hand radiographs).* For individual work the students are given a print of two radiographs (of a child's hand and an adult's hand, respectively, although they are not told this) and asked to list the differences between the two hands. Questions in practical examinations are often phrased this way, and students tend to tackle the exercise as though it were an examination question. Some statements can be tested by reference to the prints alone, e.g., comparison of the number, size and shape of the shadows in the two prints: we find it convenient to refer to these as "facts." But many cannot be so tested, e.g. "bones in the wrist have fused." These we refer to as inferences. The selection of the kind of statements made appears in discussion to have been related to the student's interpretation of the question; there is disagreement as to whether inferences were or were not asked for. It is also related to the meaning the exercise has for the person; mostly statements of fact are found boring and useless, while inferences are more "important" or "significant." Only in discussion does it become clear that it is possible to make several incompatible inferences from the same data.

Naturally the disclosure of the inadequacies of their personal approach to an orthodox exercise can be very disquieting to some students. I feel that it is important to show them that their behavior is not extraordinary, but that generation after generation of students have made just those mistakes. This can be indicated by playing tape recordings of extracts of previous discussions showing how other groups have fallen into similar errors.

2. *Observation (the rotating trapezoid).* In this case the discussion is not preceded by an exercise but by a demonstration of the Ames rotating trapezoid[4] and the aniseikonic spectacles.[5] The aim of this is to show that the interpretation of the images of even everyday objects like window frames is a result of assumptions based on past experiences of which one is usually unaware. The aniseikonic lenses illustrate that it may take a long time to become aware that the retinal image of a familiar thing has been distorted; this can be compared with the resistance to the receipt of new information generally. The impact of these demonstrations on some students is very powerful; one said "But you can't have the whole world a jelly" and another "It's as though my world was cracked open." Probably everyone has experienced the extreme slowness with which preconceptions which were acquired unconsciously in childhood wear away, even under the most determined and well-considered attack by intelligence."[6]

3. *Observation ("Seeing's Believing").* At the end of the previous discussion the students are given a copy of an article "Seeing's Believing"[7] which discusses some general problems of perception and deals specifically with the hand radiograph exercise. This forms the basis of the third discussion, which is intended to help the assimilation of the two preceding ones. The aim of these three discussions is to demonstrate some of the factors which influence the kind of information that is extracted from a specific visual experience. We hope that at the end participants will have absorbed some useful ideas on the role of interpretation in perception.

4. *Language.* Students are given a short quotation containing the terms "average body," "average condition," and "anatomical normal type." They are asked to write what they thought the author meant by those terms, and also to give all the definitions of "normal" they could think of.

At the beginning of the discussion there is usually agreement that the meaning of the passage is clear and it is not until they try to define what the author meant by the terms that they realize how complicated this business of "meaning" can be. Students tend to get very impatient with others who do not accept their version, and later very frustrated at their own difficulties in expressing their ideas. Sooner or later there are complaints that words are vague, but people really do understand what they mean; it is unfair to critize the use of words apart from their context, so this hairsplitting analysis is useless. A sense of importance can be restored by reference to the discussions of the word "normal" by Daly King[8] and Ryle[9].

During discussion the following points become clear. In some cases a person may think a word has only one, well-defined meaning. More often, people think that a word is vague or has several meanings, yet in their reaction to the word, they may be very selective or specific. When a word has more than one meaning, the person using it partly prescribes its intended meaning by the context in which he uses it, but it may or may not convey the intended meaning to the hearer. When a word has several meanings, it may be difficult to keep them separate. There is little danger of confusion in cases where the different meanings apply to very different fields. When meanings are related and overlap, however, they tend to confuse thinking. Thus when the word "normal" is used in an anatomical context (referring to the usual or commonly occurring) it is difficult not to be influenced in thinking by the physiological connotation of healthy.

5. *Classification.* The students are asked to write notes on this topic in preparation for discussion. Some problems of classification have already been hinted at in the previous discussion.

In diagnosis we are using a classification system to help us to predict and to extrapolate. We use certain signs and symptoms as indications that the disease is of a certain kind or class—we give it a name. If we have correctly placed it in its class, we can predict a great deal more about the patient than we have been able to find out in the clinical examination. We exploit our own and other people's experience of similar cases. If we have placed the patient in the wrong class, our predictions will be wrong.

It may be true that "a rose by any other name would smell as sweet"—that some information we get directly from an object may be the same whatever class we put it in. The ro-

tating trapezoid demonstration has shown us, however, that much of the information one gets from an object is dependent on one's assumptions about its nature., i.e., about its appropriate class. The information we get, what we see, is the result of our classifying the trapezoid as a window frame and endowing it with the properties of a rectangle. When, as in diagnosis, what we are concerned about is information we do not get directly from the patient but by extrapolation, then it is very important what class we put him in.

6. *Evidence.* Students are given a copy of a paper published in a scientific journal reporting some experiments and the conclusions drawn. They are asked to consider how far the conclusions were justified by the observations reported, and also to design an experiment to test the hypothesis which the author had tried to test.

In assessing evidence, people are much affected by factors extraneous to the actual observations reported. They say that if they had read the paper in ordinary circumstances they would have been far less critical than now, reading it as a preliminary to discussion.

The discussion is rounded off by showing how closely related their ways of assessing the scientific experiment are to the judgments we all have to make in everyday life.

7. *Causation.* Students read part of a paper by Gregg[10] which discusses the influence that the idea "that each disease has its own specific, single and sufficient cause" has had on medicine. This exercise is clearly linked with the preceding one, for some problems of causation were already discussed there. It is also less specifically related to the whole course of discussions, for it opens with the statement that "The past 75 years have been influenced by an idea so general and all-pervasive that it escaped explicit attention" and shows how an assumption can be both a good and bad influence.

Another subject raised by the paper is one with which students are much preoccupied—the status of the doctor, his relation to the patient, the effect of the National Health Service, etc., and they seem to like to discuss this. Here again we get statements about fundamental attitudes, e.g. "I don't want to be regarded as a good bloke personally as a G.P., you see, I want to be regarded as an efficient G.P. . . . I'm not concerned with being popular."

8. *Summary.* In preparation for this last discussion students are asked to read a short article on group discussion.[11] We attempt to review the course, discuss its aims and techniques, and what the students feel are its effects.

Summary

So much for our course in its present form, sinewy, I hope, even if small and thin. It raises many problems, most of which we have not time nor skill enough to tackle yet, but it is worth keeping them in mind, and I would like to end with an indication of what might be a fruitful development in medical education if ways could be found.

It is fairly well accepted now that it is useful to study "what kind of fella's got a bug" as well as "what kind of bug's got a fella." Soon perhaps it may be more widely accepted that it might be useful to study what kind of student takes a curriculum and how he reacts to it, as well as what kind of curriculum a student takes. For it is not unlikely that the capacity of a medical graduate to be curious and full of initiative, to ob-

serve accurately and comprehensively, to arrange and interpret facts wisely, and to use words with conscious precision, is related to what kind of adjustments he had to make as a student to the impact of his medical course.

In this series of discussions we have revealed some of the factors which influence the kind of information that is extracted from a specific experience; some are useful, some distort, and they range from the trivial to the profound. Possibly a recognition of some of the factors that influence the reaction of the student to the curriculum would be effective in helping him extract from it more that is useful, less that is distorted. Some of these factors will be trivial, others will be concerned with the things he cares about—why he took up medicine, or how he thinks a doctor ought to be and how he feels he measures up to this. If he understood better some of his general ways of thinking and feeling he might adapt more efficiently to the very stringent demands of his training.

REFERENCES

1. Royal College of Physicians 1944. "Report on Medical Education from the Planning Committee."

2. Adorno, F. W.; E. Frenkel-Brunswick; D. J. Levinson and R. N. Sanford. 1950. "The Authoritarian Personality."

3. Foulkes, S. H. "Group Therapy, a Short Survey and Orientation with Particular Reference to Group Analysis," *Brit. Jour. Med. Psychol. 23*:199-205, 1950.

4. Ames, A. "Visual Perception and the Rotating Trapezoidal Window," *Psychol. Monograph 65*:324,1951.

5. Kilpatrick, F. P. "Human Behaviour from the Transactional Point of View," Institute for Associated Research, 1952.

6. Bridgman, P. W. "The Nature of Physical Theory," Princeton University Press, 1936.

7. Johnson, M. L. "Seeing's Believing," New Biology *15*: Penguin Books, 1953.

8. Daly, King C. "The Meaning of Normal," *Yale Jour. of Biol. & Med. 17*:493-501, 1945.

9. Ryle, John A. "The Meaning of Normal," *Lancet.* i., 1941.

10. Gregg, A. "The Golden Gate of Medicine," *Annals of Int. Med. 30*:810, 1949.

11. Johnson, M. L. "Theory of Free Group Discussion," *Health Edu. Jour. 11*:112-117, 1953.

The "Full-Time" Controversy

DONALD FLEMING

IN 1900 WILLIAM H. WELCH, professor of pathology at Johns Hopkins and the leading Influential of American science, might have been excused for thinking that the fabric of the medical institutions at Johns Hopkins had been built to last out his time. All the chief figures in the medical faculty—of which not one man was less than first-rate—might hope to live for another 20 years or more. All of them together had fallen into a kind of habit of success. They need only not break their stride to go on from triumph to triumph.

But the mixture was unstable, and a crisis approached. The key figures were Welch, Franklin P. Mall, professor of anatomy, and William Osler, professor of medicine—and Mall above the others.

Mall was the greatest American anatomist and by far the most distinguished scientist on the medical faculty—the strongest link in the creative tradition. A small, trim, handsome man, unhurried with his single experiment each day, a perfectionist in all of his undertakings—and almost perfect—quiet, sarcastic, self-effacing, and inexorable, he was the man of iron will who wore down opposing wills and always had his way. He was feared by most students when they were under his control and thereafter hated by some with a hatred that was not appeased by his death and still breaks out after 50 years.

His "inductive method" of teaching anatomy to beginners, by which he meant giving them something to cut and going away and leaving them alone, left the student ignorant of regional anatomy and forced the surgeons to offer instructions of their own. "Mall failed the men." But this kind of failure he prided himself upon as setting anatomy free from its old subservience to medicine. He meant to be a man of science and a teacher of scientists, who would have to make their own accommodation to practical medicine. The operative word in scientific medicine was for him "scientific." It was no accident that Gertrude Stein, who was good at science but had no vocation for medicine, preferred Mall to all of her other instructors at Johns Hopkins. Nor was it any accident that he succeeded brilliantly with advanced students and created a school of anatomists of equal importance with the Welch school of pathology.

Mall did not meet with uniform hostility from the clinical men, who had to make in the first instance not scientists but physicians. The chief surgeon of the Johns Hopkins Hospital happened above every other surgeon of his time in America to belong to the laboratory tradition; and apart from Welch, Mall was William S. Halsted's best friend.

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One of Halsted's chief pleasures was to talk with Mall about current and projected researches. Mall could be sure of never being reproached by Halsted for being a poor teacher. One could almost say that Mall's best work was Halsted.

This identification was well understood at the time, and by no one better than Osler, whom it maddened, baffled and frightened to see a great surgeon warped from medicine to science, so that one of the clinical professors had gone over to the enemy. Osler never attempted to conceal his distaste for the "inductive method" of teaching anatomy, and he always deplored in private the remoteness of Mall and Halsted from the students and their elevation of research above teaching and science above medicine. "A man who is not fond of students and who does not suffer their foibles gladly," he wrote, "misses the greatest zest in life; and the teacher who wraps himself in the cloak of his researches, and lives apart from the bright spirits of the coming generation, is very apt to find his garment the shirt of Nessus." The public, he said, would insist that scholars in any institution founded for the advancement of medicine devote themselves to the cure of disease and the prevention of death; and the public was right.

Every item in this indictment fitted either Mall or Halsted or both. But when all three men were colleagues together the lines of battle were never clearly drawn; and except for the open scandal of the "inductive method," Osler and Mall engaged in no real controversies. But personalities maneuvering for conflict will make themselves felt in advance of the appropriate issue. At Johns Hopkins there was a gradual clearing up of the relationship of Mall to Welch as seen through Osler's eyes, a kind of shaping up of the human situation that no one could lay hold of with any assurance till everything burst into the open and cast light behind it.

Mall was said to teach, if at all, not by guiding the hand but jogging the elbow and looking in with a word of advice from time to time; and his enemies liked to think of his role at Johns Hopkins in these terms—"gumshoe tactics" with no speeches but a quiet suggestion from behind someone else's shoulder and a whispered question for someone else to put, and a murmur of deprecation at the wrong answer. His friends and admirers painted the same portrait of a man of tremendous self-assurance but no stage presence. At the beginning of the 20th century many people felt certain that Mall was exercising great influence over Welch from behind the scenes.

Mall had, in the nature of things, an unshakable hold on Welch. He had been the most difficult of the whole medical faculty to secure for Johns Hopkins, and could at any time have gone elsewhere, as to Harvard in 1912; and the fact of his coming was almost entirely a tribute to Welch. But at a much deeper level Mall represented for Welch the ideal of the scientific life; an unbroken line of researches from youth into age with no distractions or diversions, the perfect embodiment of the creative tradition, the man whom Welch would himself have wished to be.

The issue that made this seem a matter of critical importance was "full-time." In the winter of 1885-1886 when Mall was working with Carl Ludwig in Leipzig, the old man had confided to him one last dream, of placing clinical medicine on a university basis, with the clinical professors, as well as the preclinical, devoting their full time to research rather than engaging in private practice on the

side. This idea Mall had taken with him to the University of Chicago, where it seems already to have been making headway before his arrival. After Mall returned to Baltimore, he worked closely with the Canadian Lewellys F. Barker, who had studied with Welch before the opening of the medical school. In due time Barker went to Chicago to fill Mall's old chair. From this vantage point he delivered in 1902 a famous address to the western alumni of Johns Hopkins in which he came out for clinical full-time and attracted general attention throughout the country. He made no secret of having been influenced by Mall.

From this time forward full-time threatened to split the medical profession in two. If the experiment were to have any prospect of success it would need the prestige of the best medical school in America behind it. But nothing could be done without winning over one or the other of the two great charismatic figures of the Hopkins faculty; and if Welch and Osler took up opposite positions there would sooner or later be a confrontation of personalities and ideals from which the medical school might never recover. Osler, a clinician with a large private practice, was from the beginning utterly opposed to the whole idea for the same reason that he feared and mistrusted its sponsor Mall as a doctrinaire of pure science. The unknown in the situation was Welch.

During Osler's time in Baltimore Welch made only one short address on the teaching of clinical medicine, in 1901. He then called for advanced training in clinical research and spoke for the need of recruiting clinical as well as preclinical professors from the country at large. This step would discard success in local practice as the test of fitness for a chair. But it did not follow that clinical men chosen for their bent toward research would choose not to engage in practice. The best of them might be expected like Osler and Howard A. Kelly to become consultants and surgeons in great local demand. Welch had not yet gone the whole way with Mall.

That he would end, however, by going beyond this point was predetermined by everything that he had done and been and Osler had not; and beneath the surface if not above there would have to be a final definition of the antithesis between them. For Mall could only exert the influence upon Welch, who was neither weak nor pliable, on the condition of their being at bottom the same kind of man. Consciously or not, those, like Osler, who feared Mall were ultimately fearful of Welch himself; and in this they were right.

Full-time was said by its enemies to be an untried experiment which might fail. But so had been the life-pattern of Welch; and so also had been the whole conception of the Johns Hopkins University, hospital and medical school. Welch had always struck out for the unoccupied territory, and he had never yet been disappointed.

Full-time was said by its enemies to be doctrinaire and impractical. But to study in Germany, as Welch had done, rather than to go home to Norfolk had been impractical; to go from New York to Baltimore had been in his friend Frederic Dennis's opinion "impractical;" to require a college degree, with French and German, for entrance to a medical school had been doctrinaire in the extreme. In retrospect Welch's own specialty had been to make the things that would not work. work.

Full-time was said, finally, to be depersonalizing and destructive of human relationships. Full-time men,

so the argument ran, would be isolated and cut off from the local profession, both from the nature of their work and the kind of temperament that would be likely to take it up—scientific, self-contained and a little cold. But Welch too had deliberately cut himself off from the work of a consultant and by so much diminished the range of his acquaintances. And he preserved an inviolable remoteness, of a pleasant sort, from all but a handful of men. His own popularity served to conceal the significance of the fact that the two members of the medical faculty whom he had been most conspicuous in bringing to Baltimore were Halsted and Mall—the least popular of the instructors, the most withdrawn from living contacts, the most doctinaire in their commitment to science as opposed to medical empiricism. They were, in fact, precisely the men in whom Osler found and feared the image of the "full-time man."

For Welch their intellectual distinction predominated over any possible defects, and this was for him a general principle in academic appointments—"perhaps we attach too much importance to personality versus scholarly achievement." The roots of this deemphasizing personality went deep into Welch's own character and temperament, and were largely independent of circumstances. But perhaps his role of Influential had strengthened a native impulse to judge men of science not by their qualities of personal address but by their intellects. For it may well have been the condition of maintaining his self-respect, as he withdrew from the research enterprise, to go on sharing with the productive scientists their emphasis on intellectual capacity above everything else. He had become a kind of politician in the cause of science, but he was incapable of being merely a politician, who valued the political arts for their own sake. If the coming of full-time were to mean that in the filling of clinical chairs a man's personality would only count in so far as he knew how to project it through the medium of his research, this would be for Welch not a loss but an incalculable gain.

Osler, who had done research and introduced important innovations in teaching and administration, was the last man whom Welch would have charged with trading upon his personality. If Osler had been gruff, secretive, and unforthcoming as a human being, he would still have left a mark on the history of medicine. But it was for personal qualities and unmediated disclosures of himself that men loved and followed Osler in life and after death; and he for his part had almost a mystique of personality and warm human relationships. He was and meant to be an ethical figure, who saw in medicine not only a means of healing the sick but of giving "unity, peace and concord" to the healers. For him it was left to speak of the local medical society in the same tone that other men had reserved for the regiment and the congregation—a place where all selfish wills must be yielded up and animosities put aside. For a man who consistently struck this note, full-time was a moral calamity, a disastrous impoverishment of the clinical man's right and duty to be implicated in the whole community of physicians. A man who stood aside from the process of humanizing and being humanized by the friction of personal contacts might be a scientist but never a doctor. The increasing application of science to medicine left Osler unshaken in his conviction that medicine itself must remain an art and distinctively the art of establish-

ing personal rapport between the physician and the patient.

At Johns Hopkins, Osler was balanced for a time against Welch. But no balance of which Osler was a term could endure for very long. It was in his nature always to be moving on. As early as 1894 Howard Kelly had told Tom Cullen that Osler wanted to go to England and be knighted; and the opportunity to take the first step came in 1904 with the offer of the Regius professorship of medicine at Oxford. Osler was then tired, overwhelmed by his responsibilities in America, and conscious of having done the work which he had meant to do at Johns Hopkins.

Welch on hearing the news of Osler's resignation wrote that the loss would be "irreparable." But in spite of the perfect good feeling and mutual respect that always prevailed between Welch and Osler, Osler was apprehensive about the future. At the close of his last faculty meeting, he turned to Mall and said: "Now I go, and you have your way." This amounted to saying that Welch would come down in the end on the side of all the things that Osler mistrusted and feared in Mall. For Welch would be more than ever now the dominant figure in the medical school; and only through him could Mall "have his way."

Welch at 55 now confronted the necessity of taking hold at Johns Hopkins as he had not had to do since the very beginning. He had the advantage of the fact that he, not Osler, was the one indispensable man on whom everything turned. Osler's departure was shattering; the departure of Welch would have been catastrophic. But short of his own death, the loss of Osler was the most serious imaginable blow and might conceivably have broken the Hopkins stride forever. To prevent this Welch had to undertake a kind of refounding, rethinking and reinvigoration of the medical tradition at Johns Hopkins.

His first task was to find a successor for Osler, in the knowledge that any choice would be a disappointment. Welch followed the only possible course of choosing a man who made no pretense of having the personal qualities of Osler, the tall, thin, handsome, gray ascetic Lewellys F. Barker. Osler had helped to train Barker and thought highly of him. But of all possible candidates for the chair of medicine, Barker was most closely associated with Mall and full-time.

Barker was not however appointed on full-time. The innovation connected with his return to Baltimore was noncontroversial—the setting up between 1905 and 1907 of three clinical laboratories for advanced research in biology, physiology and biochemistry. This was a distinct advance over the teaching laboratories established by Osler and was soon imitated in progressive schools throughout the country. Barker had taught anatomy at Chicago, and many pitied him as he sat hour after hour in the library working up the subject which he was going to teach in succession to the most famous clinician in the English-speaking world. He ended by gaining general respect. Welch had got successfully over the first hurdle in his task of consolidating the reputation of the medical school. Ironically, Barker came to be an enormously successful private consultant and formed the local ties desired by Osler.

But the initiative in the development of the medical school was about to be taken from Welch by a layman, and handed over to Mall. The layman was Abraham Flexner, who had taken his bachelor's degree at Johns Hopkins in the prime of Daniel Coit Gil-

man, the university's first president. In many ways Gilman remained his chief inspiration forever afterward; and Flexner with his perfect sympathy for Gilman's ideals became the most intelligently loyal alumnus the university ever had. At the end of 1908 he joined the Carnegie Foundation for the Advancement of Teaching to prepare a report on medical education in the United States. For this purpose he made a great historic tour of discovery and saw for himself, unannounced, almost every medical school in America—opened the door marked "LIBRARY" at the College of Physicians and Surgeons of Los Angeles and looked in vain for books, saw the floor of the "dissecting room" at Kansas Medical College in Topeka strewn with corn "and other things" and doubling for a chicken yard, found the "laboratory" of bacteriology, pathology and histology at Maryland Medical College in Baltimore compressed together into a few dirty test tubes standing in pans and cigar boxes; and discovered that these and like conditions were not exceptional but the rule. Almost everywhere the faculty consisted of busy practitioners with no time for teaching well and no thought of research; few schools had control of a hospital for adequate clinical instruction; and the highest pretense to admission standards that most of them made was to require a high school diploma or its equivalent in their catalogue and then to admit anyone who turned up.

Flexner found only one medical school in America of which he had no serious criticism, that built by his idol Gilman and his brother Simon's idol Welch. In the famous Bulletin Number Four of the Carnegie Foundation, "Medical Education in the United States and Canada," published in 1910, Flexner proposed two chief things: that most of the medical schools should die or be killed and that the survivors should remake themselves on the pattern of Johns Hopkins. Bulletin Number Four amounted to a sentence of execution for at least half the American medical schools. Through Abraham Flexner, who did to death more bad schools in less time than any other man in the history of the world, Johns Hopkins forced all other medical schools to approximate its own standards or die. With this historic proclamation of the supremacy of Johns Hopkins, one period in the life of the medical school came to an end, when Welch and Osler had pulled together. For both of the Flexners the mainspring of the whole enterprise had been Welch and Welch alone.

As a result of the success of Bulletin Number Four, Flexner went abroad in 1910 to study medical education in Europe. He spent much time in Munich and there had "an extraordinary piece of good luck." "Professor Mall of the Johns Hopkins was there with his family during the entire time." They went together to laboratories, clinics and lectures, and Mall took Flexner in hand in his own particular way. "In the report which I subsequently wrote the chapters dealing with medical education in Germany were profoundly influenced by Mall's apparently unconscious comments, criticism and suggestions. He never tried to tell me anything, but led me to see what I might otherwise well have overlooked." With mature men and women of superior intelligence Mall never failed to bring off his chosen trick of teaching without teaching; and Flexner was a very important pupil.

How important only appeared when he received a summons from Frederick T. Gates, the philanthropic

adviser of the Rockefellers. Gates had the most compelling of all human questions to put: What would Flexner do with a million dollars? The answer came back without hesitation. "I should give it to Dr. Welch." Why? Because with an endowment of $400,000 Welch had built "the one ideal medical school in America" as far as it went. "Think what he might do if he had a million more." Gates therefore commissioned Flexner to prepare a report on the needs of Johns Hopkins

Welch, interested but "not excited," arranged a dinner for Flexner at the Maryland Club with Mall and Halsted, and repeated the million dollar question. After 20 years Mall's moment had come. "If," Flexner reports him as saying, "the school could get a sum of approximately a million dollars, in my judgment, there is only one thing that we ought to do with it —use every penny of its income for the purpose of placing upon a salary basis the heads and assistants in the leading clinical departments, doing for them what the school did for the underlying medical sciences when it was started. That is the great reform which needs now to be carried through." The clinical men had done brilliant work as it was; but they could do still better with full-time. Halsted, a full-time man by nature, agreed.

The issue was joined at last. At the end of a three weeks' stay in Baltimore Flexner proposed to Gates that a million and a half dollars be given to Johns Hopkins to establish the medical, surgical, obstetrical and pediatric clinics on the full-time basis. On receipt of Flexner's report, the General Education Board—the Rockefeller organization for such purposes—began at once to make plans for an appropriation in excess of a million dollars and awaited a request from the university.

As always everything at the medical school turned on Welch, and the question became whether he would or would not push full-time. In an address at the University of Chicago in December 1907, he had come out openly for the general principle: the heads of clinical departments "should devote their main energies and time to their hospital work and to teaching and investigating without the necessity of seeking their livelihood in a busy outside practice and without allowing such practice to become their chief professional occupation." In 1910 he attempted without success to apply this principle in the creation of a clinical department for the great Austrian pediatrician Clemens von Pirquet, the effectual founder of the concept of allergy. Here the matter had rested till Welch by his choice of Mall—and Mall's best friend Halsted —to confer with Abraham Flexner predetermined the character of Flexner's report. By March 1911, when Flexner presented his case to the trustees of the university, Welch was "more radically outspoken" than ever before; any doubts or fears had vanished. In June the trustees, under the guidance of Welch, approved the principle of full-time (with the reversion to the university of all fees from private practice), subject to the consent of the medical faculty.

The bitterest controversy in the history of the medical school then broke loose, with Welch as an interested arbiter. Osler in Oxford began to get reports on the proposed reform in April 1911 and lost no time in writing to his correspondents in Baltimore that the whole idea was "Utopian." He resented the implication that the clinical professors had made them-

selves rich—"I did not take away from B a dollar made in practice"—but beyond this he deplored the effort to shrink the clinical men to the dimensions of a laboratory. "What would the school have been if the clinical men had not been active in the local and national societies? Would whole-time men have the same influence in the profession at large—I doubt it." But Osler did not get really angry until a copy of Flexner's report to Gates reached him in August "full of errors and misconceptions" including as he thought unmerited aspersions on his protege Howard Kelly. Osler determined to write an open letter of protest to President Ira Remsen and had copies printed for distribution to the interested parties in America. "I fear," he wrote to Remsen, "lest the broad open spirit which has characterized the school should narrow, as teacher and student chased each other down the fascinating road of research, forgetful of those wider interests to which a great hospital must minister."

From this time forward there was no doubt that full-time could be floated, if at all, only at the cost of lasting ill-will and the probable splitting in two of the medical faculty, the "very happy band" who had always pulled together. Osler's determination to take an active part in the controversy would in itself have produced a grave crisis; but to this was added the ironic fact that Barker, who made the idea of full-time famous, now concluded that he could not give up the lucrative private practice which he had acquired since coming to Baltimore. He would not stand in the way of reform, but he would not embody it or be the symbol of an effortless transition. There would have to be a new professor of medicine. At least one disciple of Mall had grown away from him.

Welch responded to these difficulties by doing nothing at all except to foster informal discussion. The trustees had given their approval in the late spring of 1911, but the final decision was not reached until October 1913, nearly two-and-a-half years later. From January 1913 to June 1914 Welch was acting president of the university, and could have been the permanent president, but even then he scrupulously avoided any pressure on his colleagues. He kept his own counsel, even more than usual; he had decided to relieve the tension by giving to everyone the sense of having infinite expanses of time in which to conduct the debate. In the meantime Osler kept up from Oxford a drumfire of objections and wrote on one occasion in 1912 that full-time would lead to a faculty of Halsteds—"a very good thing for science, but a very bad thing for the profession."

Abraham Flexner and the others in New York fretted under the long delay. "Why," Flexner wrote to Mall in confidence, "doesn't Dr. Welch either shoot or give up the gun?" When Mall on his own initiative showed the letter to Welch as a means to prodding him, Welch though nettled did not budge but went on waiting. Finally, in October 1913 he as president of the university announced to the General Education Board that Johns Hopkins would initiate full-time; and the board appropriated $1,500,000 for this purpose.

Osler in disgust said publicly that full-time would probably lead to the production of "a set of clinical prigs, the boundary of whose horizon would be the laboratory, and whose only human interest would be research." By consent of Welch the spirit of Mall — and of himself — now reigned through the whole course.

Welch took no pleasure in his triumph over Osler, and liked to point out that Osler at the end of his life was urging full-time upon his own alma mater, McGill. But in Baltimore itself the men of Osler's temperament went on thinking for many years that a grave mistake had been made. The chief opponent of full-time among those on the faculty in 1913, Howard Kelly—whose own department of gynecology was not affected for the present—chose to remain and showed his good faith by undertaking new researches. "I don't feel," he wrote the next year, "that I dare hold my position and drift along as I have done in the past. Such is the good result of competition and all-time service in the other departments."

If Howard Kelly was too great a man to be resentful or harbor grudges, others were resentful for him, and for Osler and themselves. This was the price that had to be paid for retaining leadership in the reform of medical education. Welch by his forbearance and good temper had reduced the price to a minimum, but he and his name and the name of Johns Hopkins had come to be a national possession and could not be sacrificed to local considerations, even their own. The image of the ideal Hopkins had to be projected with all possible sharpness even at the cost of inflicting great strains and pressures on the actual structure. From 1913 forward to 1939 the principle objections to full-time for the leading men in clinical departments grew increasingly faint; and all progressive schools gravitated toward full-time.

Genetics in Medical Education

C. NASH HERNDON

IN SOME RESPECTS the 1954 Teaching Institute turned out to be something of a surprise to those of us who were invited to represent medical genetics as a scientific discipline. Genetics is certainly the "little brother" of the group, and I believe that most of the geneticists expected to be called upon to justify their very existence. Instead, we were welcomed to the fold and in effect told that we shouldn't have been so modest in the past. This attitude has been especially gratifying to those who have expended the major part of their academic effort in applying genetics to medical problems.

By way of background it may be of some interest to review briefly the current status of the teaching of genetics in schools of medicine. From the replies to a questionnaire survey made during the autumn of 1953 and later reported in the Journal,[1] it appears that some instruction in genetics is given in 55 per cent of the medical schools in this Association. The amount of time devoted to the subject and its place in the curriculum vary widely. In spite of the variation, the fact emerges that an apparent majority of those responsible for curriculum planning in our schools feel that the student of medicine should have some systematic training in genetics.

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Genetics in Practice

If genetics is to have a place in the curriculum, it must justify this by demonstrating that it offers something that is essential to the basic training of the medical student. This question must first be answered: *of what use is genetics in medical practice?* Although a large number of papers and even a couple of books have been written on this subject, the most fundamental answer may be that knowledge of genetics will contribute to the physician's basic understanding of the etiology of disease. Genetics provides the scientific basis for the concepts of individuality and variation within the species, and hence for certain differences in susceptibility to disease and for some types of hyper-reaction. In a broad sense, genetics is the study of the endogenous factors in disease causation. An understanding of genetics contributes much to an understanding of the complex interactions that exist between man and his environment.

Pathologic genes arising by mutation are in themselves etiologic agents of disease. The number of specific disease entities that are primarily

due to a single gene mutation must be reckoned in the hundreds. With the increasing control of infant mortality and infectious diseases, and with the change in age composition of our population, diseases of genetic etiology are accounting for an increasing proportion of medical practice. This large group of diseases will be better understood by physicians who are familiar with the principles governing single gene transmission and action.

The truly basic biologic nature of the laws of genetics is demonstrated by the fact that many of the principles applicable to man are also applicable to micro-organisms. The phenomenon of mutation in bacteria is comparable in all essential respects with mutations occurring in multicellular organisms, including man. The study of bacterial mutations and population dynamics has provided vitally useful information in connection with the uses of antibiotic drugs. A well-rounded knowledge of infectious diseases now requires some conception of the genetic factors operating both in the invading organism and in the host.

From these considerations of etiology, it follows that genetic knowledge has a broad field of usefulness in medical practice. Diseases in which genetic factors are of importance are encountered in any specialty that can be named. In clinical practice genetics also serves as a useful tool in the prevention of disease and limitation of disability. In an increasing number of conditions it has been shown that the development of clinically overt disease depends on the existence of two sets of factors: (a) a specific genotype or genetic constitution conditioning susceptibility of the individual, and (b) some combination of specific environmental insults.

Advances in genetic knowledge are providing methods of identifying "high risk" individuals for a number of clinical situations. In about 35 conditions a "carrier state" may be identified by the use of laboratory or other methods to detect the presence of a potentially dangerous mutant gene in apparently healthy individuals. Reliable empiric risk figures for the development of certain abnormalities in the sibs or children of affected persons are now available for many conditions. Where high risk individuals may be identified by family history or by laboratory study, attention may then be directed toward modification or control of the precipitating environmental factors in an effort to prevent or modify the development of disease. This approach represents a field of preventive medicine that has only recently been opened, and which can be most effectively utilized by the clinician, particularly the general practitioner.

At this Teaching Institute there was remarkable unanimity of opinion that genetics, on the basis of these and other considerations, has earned a permanent place in the medical curriculum.

What and How

The question that obviously follows, then, is *what to teach and how to teach it*. As is true for every other subject in the curriculum, some differences of opinion arose at this point. A few of the Institute representatives expressed the opinion that the student's basic knowledge of genetics should be acquired in the premedical years. It was suggested that perhaps schools of medicine should require an adequate college course in genetics before admission to the school of medicine. The majority felt that this would not be desirable in view of the

rather general policy of recommending a well-rounded premedical education without undue emphasis on special branches of science. The majority felt that the school of medicine has a responsibility to teach genetics which it cannot shirk by "passing the buck" to the arts colleges.

There was a rather general concensus that the basic principles of genetics should be taught somewhere in the preclinical years. The applicable subject matter was discussed by those familiar with such material, with the feeling that a minimum of 10 to 12 class hours would be required to do justice to the bare essentials. Some favored making this a separate course, others recommended that this be a block of lectures within some established course. This, of course, led to sometimes extended discussions of interrelationships and integrated teaching. Some felt that the subject matter of genetics correlated best with that of embryology or anatomy, citing its importance in connection with normal development and malformations, and with the concept of individuality. Probably the majority felt that the considerations of etiology and applications to microbiology should dictate its correlation with pathology or microbiology. In my opinion, it seems logical to introduce the student to all agents of disease causation simultaneously, and therefore correlation of genetics with pathology seems preferable.

The value of integrated genetic teaching in the clinical years was generally agreed upon. Once the student has obtained a sound framework of basic principles, he will be able to move more rapidly in acquiring the necessary factual information in clinical areas with genetic implications.

Any amount of fine planning is, of course, useless unless adequately trained instructors are available to do the teaching. The question of *who should teach genetics* received considerable attention. There was general agreement that it would be highly desirable to have a trained medical geneticist on the staff of each medical school. It was felt that this person might be either an M.D. with special training in genetics or a man with a Ph. D. in human genetics with added training in the special applications of this subject to medical problems. Such a person could be attached to any department in accord with administrative convenience.

The medical geneticist could serve several functions. He could teach the course or block of lectures on general principles in the second year. He could be used for integrated teaching in many areas, as for example in the problems of maternal-fetal immunologic incompatibilities as in the Rh factor, in connection with the teaching of metabolic diseases, anemias, bone and eye diseases and in other areas. If biostatistics is taught, a geneticist could be utilized in this area, as any well-trained geneticist must have some working knowledge of statistics. The geneticist should also be available for clinical services and consultations. The value of a heredity clinic, providing a genetic counseling service for patients and their families, consultation for practitioners on the more complex genetic problems and as a center for research, has been adequately demonstrated at the University of Michigan and elsewhere.[2] Although the service aspect of medical genetics has not been widely emphasized, and remains largely undeveloped, it is apparent that there is an increasing demand for such service on the part of the general public.

The problem of teacher recruitment was discussed in relation to genetics, as in relation to other dis-

ciplines. The hard, cold fact is that there are just not enough trained people to supply a medical geneticist to even half of the schools that do not already have one. If curriculum time becomes available and it becomes known that such positions exist, it is felt that men with an interest in this field would be encouraged to obtain the necessary training and seek professional careers in this area. A number of years would be required to fill the ranks from this source, however. A new suggestion for teacher training was proposed by J. V. Neel which seems to be highly practical.

It was pointed out that on almost every medical faculty there is at least one man who already has some interest in problems of heredity in medicine and who would really like to know more about the subject. The suggestion was made that it might be possible to arrange a cooperative three-month summer workshop for teacher training at some school already doing work in this field. An intensive course could be given in the principles and methods of genetics, with the latest information being presented by those particularly competent in special areas. No one school could provide all of the personnel necessary to conduct such a workshop, but they could be readily assembled through the cooperation of several institutions, perhaps with the assistance of the American Society of Human Genetics. A workshop could not be expected to turn out finished professional geneticists, but it could provide the training necessary to implement a modest genetic program without requiring a general increase in faculty membership. Financing such a program would be a problem, but the idea seems to have sufficient practicality to make it attractive to one of the philanthropic foundations, as well as to the schools.

In summary, then, it is evident that the 1954 Teaching Institute clearly recognizes that genetics has a legitimate place in the medical curriculum. The discussions of this past meeting have been very helpful in outlining the proper scope and mechanics of genetic instruction, and in making practical suggestions for initiating a genetics program in those schools where one is not in operation.

REFERENCES

1. Herndon, C. N.: "Human Genetics and Medical Education," *J. Med. Educ.*, 29 (7): 13-19, 1954.

2. Dice, L. R.: "Heredity Clinics: Their Value for Public Service and for Research," *Am. Journ. Hum. Genetics*, 4:1-13, 1952.

Editorials and Comments

Cultivating Our Science Talent—A Must

THE IMPORTANCE OF CULTIVATING our science talent has been generally recognized in medicine, particularly in those medical schools in which research has long occupied a coordinate position with teaching in the list of objectives.

It is of considerable interest to note that after a nine-year period of ignoring the nation's needs for trained scientists and permitting the Selective Service to draft scientists-in-training at will, the Federal government is suddenly beginning to realize the error of its ways, and is suggesting investing $3 billion in safeguarding and strengthening our system of supply for professional grade scientists and engineers.

Donald A. Quarles, assistant secretary of defense for research and development, in a recent article[1] made the following important points: (a) Science and technology have completely revolutionized the art of warfare within the memory of most of us. (Witness the almost complete annihilation of the southernmost Japanese Naval Task Force when it attempted to pass through Suragao Strait under cover of darkness and was met by radar-directed gunfire from U. S. naval forces based in Leyte Gulf.) (b) While we tended to be complacent in assessing our technical position relative to the Communist world immediately after World War II "it is clear now that in nucleonics, aeronautics and electronics—in fact, in military technology broadly—we are confronted in this race by a strong competitor." (Witness the Soviet atomic test in the fall of 1949, the thermonuclear test of August 1953, the jet fighters used by the Communists in Korea, the jet bombers exhibited at the May Day show in Moscow, the U. S. S. R. light cruiser "Sverdlov" as it appeared at the British Coronation ceremonies with antennae which indicated much of the same kind of electronic equipment as is found on our most modern cruisers.) (c) The Soviets "are now graduating well-trained scientists and engineers at more than twice the rate we are in this country . . . if present trends continue it will be only a matter of a few years before their scientific and technical manpower pool passes the size of our own." (d) "The problem of enabling and encouraging young people to seek professional careers in science and engineering is one of the most important long-range problems facing us today . . . our success in this respect will have direct bearing on the outcome of the technologic race between our free society and Communist dictatorship."

Assistant Secretary Quarles also pointed out that in the new legislation proposed by the President to modify and extend the Selective Service Act and revamp the National Reserve Plan the objective is not to relieve scientists and engineers of the obligation to serve, and certainly not to find safer places for them to serve, but to put the national interest first and in the effort to spread equitably the obligation to serve,

to use the professional skills of these young men where they are most essential to our national security and welfare. This principle, he states, "applies to doctors, and it applies to nuclear physicists, aeronautical scientists and electronic engineers."[1]

This interest on the part of the Federal government in making more effective our system of supply of professional-grade scientists and engineers is indeed heartening. If funds are in fact made available, and present practices of the Selective Service System properly modified a big step forward will have been taken. The Health Careers Guidebook recently published by the National Health Council with funds made available by the Equitable Life Assurance Society, should contribute significantly to this effort in the health field by helping advisers in high schools and junior colleges to identify students early who should be helped and encouraged to enter a career in one of the health sciences.—D. F. S.

1. QUARLES, DONALD A.: "Cultivating Our Science Talent-Key to Long-Term Security," *The Scientific Monthly*, Vol. 80, No. 6, June 1955. Mr. Quarles' particular interests are in transmission engineering research and apparatus development. He is a former vice president of the Western Electric Company and a former president of the Sandia Corporation, and was for many years associated with the Bell Telephone Laboratories.

An Important Suggestion

In the course of an opening address he delivered to the Third Medical Conference sponsored by the Muscular Dystrophy Associations of America on October 8, 1954 in New York City,[1] Dr. Joseph Hinsey made a suggestion that is deserving of widespread dissemination and careful consideration.

After acknowledging with due appreciation the tremendous increase in the support of research in this country over the past 15 years he pointed out two serious problems that this increase of research grants had brought to medical schools. With the basic budgets of our 80 medical schools totalling $94 million and outside grants for research to those same schools totalling $44 million, the problems are (a) how to maintain the proper balance of our medical teachers' time and energies between research, teaching and service to patients and (b) how to see that "fluid funds of each institution are so protected that they are not unduly diverted by the needs of the research programs."

Dr. Hinsey foresees the necessity for increasing the "overhead" allotment provided in these research grants to recompense the institution for the many indirect costs involved in sponsoring project research. But more important is his suggestion that the voluntary public health agencies divert a portion of their annual income to the general support of institutions that supply their personnel. In his words, "It has always seemed to me that an organization that is devoted to the raising of funds for special research has an obligation to keep afloat the institutions that are supplying the personnel. I believe organizations like the American Red Cross and many of our other foundations could properly give consideration

to the basic support of some of our institutions, laboratories and medical schools."

The average citizen gave 30 cents to combat poliomyelitis last year, 15 cents to fight tuberculosis, 14 cents toward cancer eradication, 8 cents to the campaign against heart disease and 1¼ cents to combat multiple sclerosis.[2] The voluntary public health agencies devoted to the combating of special diseases receive from the public at least $130 million a year.[2] Is it unreasonable to ask that consideration be given to assigning a portion of those sums to the basic support of the medical schools and like institutions that contribute so greatly in providing these agencies with their lifesaving ideas and with their professional personnel?—D.F.S.

1. Hinsey, Joseph C.: "Opening Address, The Third Medical Conference Sponsored by the Muscular Dystrophy Associations of America, Inc.," *Amer. Jour. Phys. Med.*, Vol. 34, No. 1, February 1955.
2. "E Pluribus Unum," Editorial, *N. Eng. Jour. Med.*, Vol. 252, No. 18, May 5, 1955.

Medical Education's Part in Combating Glaucoma

The National Society for the Prevention of Blindness estimates that approximately one million Americans have undiagnosed chronic simple glaucoma and states that every general practitioner should assume that one in 50 of his patients who are over 40 years of age probably has this disease.

The Ophthalmological Foundation, Inc.* points out, however, that "when found in its early stages, the prognosis for retention of useful vision and prevention from blindness from glaucoma is approximately 85 per cent."

Since the presence of early glaucoma can usually be discovered by a simple objective test for ocular tensions, the Ophthalmological Foundation has instituted a glaucoma research project in which qualified ophthalmologists act as preceptors in preparing general physicians to do routine screening examinations. To date 223 ophthalmologists are acting as preceptors for over 5,000 physicians under this plan and over 1,100 cases of ocular hypertension have been found.

The foundation feels, however, that every medical student should be taught in his undergraduate course to test for ocular tension. And to assist the medical schools in assuming this responsibility the foundation has prepared and offers to make available without charge as many copies as the schools can use, of the publication "Glaucoma in General Medical Practice."

The foundation's approach to this problem of getting early recognition of developing glaucoma seems to be a sound one and medical educators should certainly welcome the opportunity to participate in such a practical and important public health effort.—D.F.S.

*"Glaucoma in General Medical Practice," National Research Division of The Lighthouse, New York Association for the Blind, 111 E. 59th St., New York 22, N. Y., 1955.

TEN COMMANDMENTS

For Medical Writers

I

Thou shalt not, unless circumstances be extraordinary, release for publication a paper that neither contains anything new nor sheds new light on something old.

II

Thou shalt not allow thy name to appear as a co-author unless thou hast some authoritative knowledge of the subject concerned, hast participated in the underlying investigation, and hast labored on the report to the extent of weighing every word and quantity therein.

III

Thou shalt not fail to place within quotation marks the words of another, nor shalt thou fail to verify the accuracy of thy quotations.

IV

Thou shalt not consider that to alter the words of another frees thee from the obligation to credit that other with an idea that thou hast borrowed from him.

V

Thou shalt not publish a reference in such manner that the reader will think thou hast read a certain article if thou has read only an abstract or paraphrase thereof.

VI

Thou shalt not write to please thyself but to meet the needs of thy reader.

VII

Thou shalt not publish, as if thou wert sure of it, that of which thou art not sure.

VIII

Thou shalt not allow one part of thy paper to disagree with another part thereof.

IX

Thou shalt not mix categories.

X

Thou shalt not fail to verify, again and yet again, thy arithmetic.

(Richard Miner Hewitt)

By permission of the J.A.M.A.

NEWS DIGEST

1955 AMA Convention

Registration figures show that more than 31,000 people attended the 104th convention of the American Medical Association, June 6-10, in Atlantic City. Nearly 12,000 physicians and 12,000 guests attended daily sessions and listened to discussions on current medical and scientific developments.

More than 40 motion pictures—including a film of the ovulation process within a living woman—were shown during the meetings of the Scientific Assembly. A closed circuit television program which featured 11 different "live" operations beamed from the hospital of the University of Pennsylvania was shown each day for a total of 23 hours of viewing.

Featured exhibit at the convention was the "flying infirmary" set up on the beach outside convention hall. This air-transportable hospital becomes a fully-equipped field medical center with 36 beds, when unpacked. Another portable hospital, a 200-bed unit for civil defense use, was demonstrated during sessions of the AMA's Council on National Defense, which held its 3rd National Medical Civil Defense Conference on Saturday, June 4.

There were 700 scientific and technical exhibits on display to the 15,000 physicians, residents, interns, students, nurses and technicians present at the convention. On public display for the first time was an exhibit featuring the new three-dimensional rubber model of combat wounds recently constructed by the medical illustration service of the Armed Forces Institute of Pathology for use as a teaching aid.

Dr. Elmer Hess of Erie, Pa., AMA president, was formally inaugurated June 7 at an evening meeting which featured an address by Dr. Norman Vincent Peale. At the same time, the 1955 distinguished service award and gold medal was presented to Dr. Donald G. Balfour of Rochester, Minn., former associate director and then director of the Mayo Foundation for Medical Education and Research. Dr. Balfour's son, Dr. William Balfour, accepted the award for him.

Among the many decisions of the AMA house of delegates was the adoption of the "one-fourth" rule, as recommended by the Reference Committee on Medical Education and Hospitals. The committee's statement, as adopted, reaffirms the recommendation of the Ad Hoc Committee on Internships that "any internship program that in two successive years does not obtain one-fourth of its stated complement be disapproved for intern training."

On June 9, the house of delegates elected Dr. Dwight H. Murray of Napa, Calif., as president of the American Medical Association for 1956-57. Dr. Murray will be inaugurated at the 1956 convention meeting in Chicago.

New Federal Appointment

Dr. Edward H. Cushing has been appointed the first U. S. Deputy Assistant Secretary of Defense in charge of health and medical defense problems. The newly-created post was established following a recommendation by the Hoover Commission on Organization of the Executive Branch of Government.

Lung Research Grants

Nearly half of the $1 million fund set up by the Tobacco Industry Research Committee has already been allocated for medical student fellowships and for independent research

projects into tobacco use and health. Twenty-one new awards recently announced brought the total to $490,000, of which $26,500 was appropriated for student grants.

Eleven of the committee's grants are for a nation-wide lung study in which medical information is being collected in various hospitals throughout the country. This research is being coordinated by Dr. Stanley P. Reimann, director of the Institute for Cancer Research and the Lankenau Hospital Research Institute, Philadelphia. The collecting of statistical data is being supervised by Dr. Edwin B. Wilson, professor emeritus of vital statistics at Harvard University.

Tropical Fellowships

Practical experience in tropical areas will be available to teachers of parasitology and tropical medicine in U. S. medical schools under a new two-year program to be administered by Louisiana State University. The advanced training is made possible by a grant of $80,000 from the China Medical Board of New York, Inc., formerly the China Medical Board, Inc.

Teachers participating in the new program will have a brief orientation session at the university school of medicine in New Orleans. Following this, they will report for training to either the San Juan de Dios hospital, San José, Costa Rica, or the University of Puerto Rico School of Medicine, San Juan, P. R.

Tentative plans provide for four fellowship periods during each year of the project, with an interval of one month between the two-month training periods. Each tropical area will have no more than five fellows during any fellowship period. The first fellowship will be awarded for July and August 1955, and applications are now being accepted. For further information, teachers should write to Dr. Henry E. Meleney, research professor of medicine at Louisiana State University.

The program was inaugurated when a survey of U. S. medical schools revealed that tropical medicine has almost disappeared from the curricula as a separate teaching entity, and that more than half the teachers of parasitology had no experience at all in the tropics.

Medical Research Bulletin

A report, "Medical Research Accomplishments," has been issued by the Social Legislation Information Service in Washington, D. C. This 56-page bulletin reviews the 1954 activities of the National Institutes of Health, principal research arm of the Public Health Service.

The bulletin reports the highlights of research progress that were made in studying mental illness, neurological and sensory disorders, cancer, heart diseases, arthritis and metabolic diseases, dental research and microbiology. Each report describes the work of a particular institute, and a final section reviews the work done by the NIH general research grants.

Copies of the bulletin may be ordered from the Social Legislation Information Service, 1346 Connecticut Avenue N.W., Washington, D. C.

Lederle Awards

Winners of the second annual Lederle Medical Faculty Awards have been announced as follows: Dr. Matthew N. Levy, department of physiology, Albany Medical College; Dr. James S. Dinning, department of biochemistry, University of Arkansas; Dr. Henry W. Elliott, department of pharmacology, University of California (San Francisco); Dr. Lloyd M. Kozloff, department of biochemistry, University of Chicago; Dr. David D. Thompson, department of physiology, Cornell University and Dr. William L. Cassel, department of microbiology, Hahnemann Medical College.

Other winners were: Dr. Manfred L. Karnovsky, department of biological chemistry, Harvard Medical School; Dr. Charles J. Imig, department of physiology, State University

of Iowa; Dr. Andrew G. Smith, department of microbiology, University of Maryland; Dr. Wilbur H. Sawyer, department of physiology, New York University; Dr. Guido V. Marinetti, department of biochemistry, University of Rochester; Dr. Robert C. Stroud, department of physiology, Medical College of South Carolina; Dr. Albert Hand, department of pathology, University of Tennessee and Dr. Lorraine Friedman, department of microbiology, Tulane University.

Also awarded were: Dr. Marjorie A. Swanson, department of biochemistry, Bowman Gray School of Medicine; Dr. Kenneth P. Strickland, department of biochemistry, University of Western Ontario; Dr. Gordon R. McKinney, department of pharmacology, West Virginia University; Dr. Charles Yanofsky, department of microbiology, Western Reserve University and Dr. Joseph T. Velardo, department of anatomy, Yale University.

These awards are made possible by the Lederle Laboratories Division of American Cyanamid Company, and are administered by an independent committee of professors from medical schools throughout the country. Winners are provided financial aid not in excess of $10,000 for a period of not more than three years. Applications for the 1956-57 awards should be submitted by October 31.

College Briefs

Albany

A series of annual lectures has been established in the name of Dr. OTTO A. FAUST, professor of pediatrics and former director of the department. The first lecture was given on May 18 by Dr. GROVER POWERS, professor emeritus of pediatrics at Yale. At the same time, Dr. Faust was further honored by the presentation of his portrait to the college in ceremonies following the lecture.

Featured at the 125th commencement exercises on June 3 was an address by Dr. JOSEPH C. HINSEY, director of the New York Hospital-Cornell medical center and former dean of Cornell University Medical College. Dr. Hinsey was also awarded an honorary doctor of science degree, as was Dr. ARTHUR KNUDSON, professor and chairman of the department of biochemistry and associate dean of the medical college from 1943 to 1952.

Dr. Knudson spent two years in Bangkok, Thailand, during World War II, assigned by the University of Washington to aid in the teaching program of the local medical schools. While there, he was instrumental in setting up the first experimental nutrition laboratory in that country.

Boston

Dr. CHESTER SCOTT KEEFER, Wade professor of medicine, has been appointed director of the school, succeeding Dr. JAMES M. FAULKNER. Dr. Faulkner will remain on the faculty as professor of clinical medicine.

Dr. Keefer, Wade professor for 15 years, has also been serving as physician-in-chief and director of clinical research in preventive medicine at Massachusetts Memorial hospitals. As director of the school, Dr. Keefer will be responsible for coordinating the educational program of the university's school of medicine and the services performed by Massachusetts Memorial hospitals.

Colorado

A new $30,000 central laboratory at the medical center has been dedi-

cated in honor of Dr. EDWARD R. MUGRAGE, professor of medicine until his retirement in 1953. The new laboratory, known as the Edward R. Mugrage laboratory, will consolidate all laboratory work for the center in one location. Dedication exercises were held during alumni ceremonies last month.

The Norlin medal has been awarded to Dr. WARD DARLEY, seventh president of the University of Colorado and former director of the medical center. The medal is awarded each year by the associated alumni to "an outstanding graduate," and was presented to Dr. Darley at the annual commencement exercises.

Cornell

The 1955 Passano Foundation award of $5,000 has been given to Dr. VINCENT DU VIGNEAUD, chairman of the department of biochemistry, for his research in the chemical and physiologic nature of the hormones of the posterior portion of the pituitary gland. Presentation of the award was made on June 8 at a reception and dinner held during the week of the American Medical Association convention. This is the eleventh award to be given by the foundation, which is supported by the Williams and Wilkins Company, in an effort to encourage medical science and research, particularly of a clinical nature.

Columbia

Dr. JOHN KINGSLEY LATTIMER has been appointed professor of urology and executive officer of the department. He succeeds Dr. GEORGE F. CAHILL, who will remain as professor emeritus, effective July 1. Dr. Lattimer also was appointed attending urologist and director of the urological service of Presbyterian Hospital.

Emory

Construction has begun on a new five-story medical clinic building. The new $1 million building will be completed within the year. It is located opposite Emory University hospital, near the recently completed Woodruff Memorial research building, Ardmore hospital, the downtown headquarters of the medical school and the new Grady hospital, now under construction. A six-building communicable disease center is planned for the same area.

Georgetown

A 10-year study of organ culture will begin shortly as the result of a donation of $100,000 from alumnus Hugh A. Grant. Dr. ROBERT J. COFFEY, professor and director of surgery, will administer the project. Purpose of the study is to develop methods of keeping human embryonic and foetal organs growing in an artificial culture, in order to transplant them from dead to living persons.

George Washington

Dr. ANGUS MACIVOR GRIFFIN has been appointed assistant dean of the school of medicine, a newly-created post. Dr. Griffin has been professor of bacteriology since 1949.

Dr. HAROLD STEVENS has been appointed professor of neurology, succeeding Dr. WALTER FREEMAN. Dr. Stevens was formerly professor of neurology at Georgetown University.

Harvard

Dr. JOE VINCENT MEIGS, clinical professor of gynecology, has resigned as chief of staff at Vincent Memorial hospital and chief of the gynecological service at Massachusetts General hospital, effective July 1. He will continue his teaching responsibilities, and will remain as gynecologist for Palmer Memorial hospital and Pondville State Cancer hospital. Dr. Meigs will also serve as consulting visiting gynecologist at Vincent Memorial and consulting surgeon at Massachusetts General.

An honorary doctor of science degree was awarded to Dr. GEORGE PACKER BERRY, dean of the medical school, at the University of Rochester's 105th commencement exercises on June 12. Dr. Berry was head of the department of bacteriology at Rochester for 17 years. In 1942, he was ap-

AN AERIAL VIEW of New York University-Bellevue Medical Center, showing the newly-constructed medical science building, on the left. On the right, is the institute of physical medicine and rehabilitation.

pointed assistant dean of the school of medicine and dentistry. He served as associate dean from 1947 until he left for Harvard in 1949.

Dr. FREDERICK H. VERHOEFF, professor emeritus of ophthalmology and consulting chief of ophthalmology at Massachusetts Eye and Ear Infirmary, was awarded an honorary doctor of science degree by the University of Louisville on June 5. Dr. Verhoeff was further honored by a dinner given for him on June 6 by the faculty of the section on ophthalmology.

Illinois

A grant of $10,000 has been awarded to Dr. HARRY F. DOWLING to direct a program of work of an investigative nature in infectious diseases and related fields.

Dr. KLAUS R. W. UNNA has been appointed professor and head of the department of pharmacology. He has been serving as acting head since September, following the resignation of Dr. CARL C. PFEIFFER, now serving in a similar capacity at Emory University.

Iowa

Dr. EUGENE F. VAN EPPS has been appointed professor and head of the department of radiology, effective July 1. He succeeds Dr. H. DABNEY KERR, head of the department since 1930.

Michigan

The Alice Crocker Lloyd Radiation Therapy center, in operation for approximately a year, was formally dedicated in ceremonies featuring an address on "Medical Applications of Atomic Energy" by Dr. JOHN BUGHER, director of the division of biology and medicine of the U. S. Atomic Energy Commission.

The center provides research facilities for the rigid clinical investigation of teletherapy, under a contract with the U. S. Atomic Energy Commission. It also serves university hospital patients as the radiation therapy division of the department of radiology, and provides training for future radiation therapists.

N. Y. U.—Bellevue

Dr. JONAS SALK, a 1939 graduate of the school of medicine, was awarded a gold medal, as well as an honorary degree, at dedication exercises of the new medical science building. The medal was presented to Dr. Salk by the medical alumni association for his contribution to the control of poliomyelitis.

More than 4,000 persons attended the June 2 dedication of the new $10

million building which will provide classrooms and teaching laboratories for all departments of the college of medicine and the postgraduate medical school. Also located in the building will be the institute of cardiovascular disease, the institute of industrial disease, the institute of industrial medicine, the institute of rheumatic diseases and the cancer institute, as well as the medical center library.

Presiding at the ceremonies was Winthrop Rockefeller, honorary trustee and former chairman of the center's board of trustees. His gift of $550,000 to furnish an auditorium and four lecture rooms in the new building was announced at the conclusion of the exercises. F. Abbot Goodhue, present chairman of the board, opened the program. The main address was delivered by Adlai E. Stevenson, who was also awarded an honorary law degree.

S. U. N. Y.—Brooklyn

Dr. HOWARD R. POTTER, professor and chairman of the department of psychiatry and director of psychiatry for Kings County hospital center, has just been appointed dean of the medical school. A member of the faculty for 15 years, Dr. Potter has been acting dean since September 1, 1954.

The 1955 CIBA Award for meritorious accomplishments in the field of endocrinology has been won by Dr. JACK CROSS, associate professor of anatomy. The award was presented to Dr. Cross at the 37th annual meeting of the Endocrine Society on June 3.

Dr. Cross is taking a leave of absence for six months to continue his research at Oxford. He will continue his work pertaining to enzymatic reactions involving iodythyronine.

Pennsylvania

Dr FRANCIS C. WOOD, professor and chairman of the department of medicine, has been appointed the first Frank Wister Thomas professor. This new professorship has been established to honor the late Dr. Thomas, an honor graduate of the class of 1880. Funds for establishment of the chair were provided through a legacy left by Dr. Thomas' widow.

Rochester

Dr. JAMES LOWELL ORBISON has been appointed head of the department of pathology, succeeding Dr. GEORGE HOYT WHIPPLE, who retires on June 30. At the same time, Dr. Orbison has been appointed the first George Hoyt Whipple professor of pathology, as of July 1. This chair was made possible by an endowment fund from donations by the Eli Lilly Company, for work in the study and standardization of secondary anemia liver extracts.

Tennessee

A portrait of Dr. T. P. NASH, dean of the school of biological sciences, painted by Raymond P. R. Neilson of New York, was presented to the university on June 11. The portrait was presented to Dr. O. W. HYMAN, vice president of the university in charge of the medical units and dean of the college of medicine. The presentation was made by Dr. CHARLES J. DEERE, assistant professor of medicine and a former student of Dr. Nash. Ceremonies took place at the new chemistry-physiology building, with Dr. SAMUEL L. RAINES, head of the department of urological surgery, presiding.

Correction. In the June issue of the Journal, we referred to grants recently given to the department of medical laboratories by the Atomic Energy Commission and the Public Health Service. We erroneously stated that these grants had been awarded to the section on clinical pathology, instead of the section on clinical physiology.

Vanderbilt

Dr. ERNEST W. GOODPASTURE, professor and head of the department of pathology, was awarded the annual Howard Taylor Ricketts award of the University of Chicago, for his work in the field of virus and rickettsial diseases.

Audiovisual News

Preview Circuits Film Appraisals Completed

This section of the Journal has from time to time carried summaries of the appraisals given to materials on the AV Preview Circuits for Medical Colleges. The following summaries complete the reports on materials previewed on the circuits during the 1954-55 season.

Cancer Films Criticized

Eleven short cancer teaching films were seen on the Audiovisual Preview Circuits for Medical Colleges during 1954-55. A total of 416 appraisal forms have been received to date. A statistical summary of these appraisals is found in Figure 1.

The lack of narration or titling was consistently criticized. Many felt the films to be useless without the sound commentary: "I gather one's own commentary could be added but I think the person making films should do this." Others pointed out that narration would not "encroach on the instructor's domain."

The repetition within films and within the series was often annoying. Some thought that the "principles" and "techniques" films of each series could be edited and combined. Others felt that each series should have been made into one film. Only a very few previewers felt that the film pace was suitable: "Speed of film was good and could follow adequately. Lecturer would have no trouble keeping pace with the subject matter of the film."

The general criticisms of techniques demonstrated varied widely from good to bad. The severest condemnations were heaped on "Technique of Aspiration Biopsy in the Breast." "The very concept of this film makes me shudder. Nine needle biopsy should never be done on a breast lesion. I could see cancer emboli being pushed into venules."

Praise of technique is illustrated in the following: "All three of these (biopsy films) were considered most useful for intimate technical training of resident physicians as a part of instruction in exact techniques; we all remarked on the excellent use of the model, and particularly liked the instrument display in the second film dealing with skin biopsy."

In summary, and as shown in Figure 1, the distribution of overall appraisals is relatively flat. The median overall appraisal for the Respiratory Series was "good;" for the Biopsy Series "good" and for the Rectal Series "fair."

Distribution: Medical Audio-Visual Institute of the Association of American Medical Colleges, 185 N. Wabash Avenue, Chicago 1, Ill., **Rental** or **Sale.**

Fractures Films Praised

"Fractures About the Elbow," produced for the Veterans Administration by Churchill-Wexler Productions, will soon complete the AV Preview Circuits for Medical Colleges. The following report is based on the first 51 appraisal forms representing 168 faculty, fellows and residents. In addition 415 student viewers were reported.

"Fractures About the Elbow" has received the most enthusiastic acclaim of any film on the preview circuits to date. It was rated "good" or

TABLE I.

ELEVEN CANCER SHORT TEACHING FILMS: STATISTICAL SUMMARY OF CIRCUIT APPRAISALS*

Series and Title	No. of Previewers		Desired Availability		Overall Appraisal of Faculty				
	Faculty	Students	College Should Own	Want to Rent	Poor	Fair	Good	Exc.	No. Resp.
RESPIRATORY SERIES:									
Principles of Bronchoscopy	168	905	40%	30%	14%	14%	34%	19%	19%
Technique of Bronchoscopy	225	568	33%	24%	12%	32%	33%	14%	9%
Principles: Collection of Bronchial Washings	144	365	37%	39%	17%	15%	36%	15%	17%
Technique: Collection of Bronchial Washings	155	484	24%	27%	26%	27%	24%	8%	15%
BIOPSY SERIES:									
Technique of Aspiration Biopsy	212	436	23%	18%	22%	18%	32%	16%	12%
Technique of Excision Biopsy	237	520	25%	14%	23%	29%	37%	6%	5%
Technique of Skin Biopsy	280	538	27%	16%	29%	21%	38%	8%	4%
RECTAL SERIES:									
Principles of Anoscopy	117	539	20%	22%	15%	42%	39%	2%	2%
Technique of Anoscopy	228	1141	19%	19%	14%	48%	32%	5%	0%
Principles of Prostatic Massage	235	1112	19%	19%	14%	41%	37%	5%	3%
Digital Rectal Touch Picture: Normal	123	589	11%	10%	21%	39%	31%	2%	7%

*In instances where previewers rated a series as a whole, their responses have been assigned to each individual title in the series, thus reducing the differences between titles within a series.

"excellent" on 96 per cent of the appraisal forms, as shown in Figure 1.

Ninety-six per cent thought the film well suited for medical students; 80 per cent thought it well suited for interns and residents and 30 per cent thought it well suited for postgraduates.

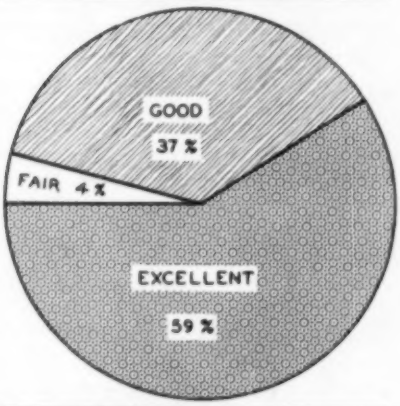


FIGURE 1. Percentage of appraisals giving the film an overall rating of fair, good or excellent. (No rating of poor was given.)

Sixty-five per cent considered it valuable for presentation as an integral part of instruction; 51 per cent considered it valuable for providing a review of a unit of instruction; and 33 percent considered it valuable for providing an introduction to a unit of instruction.

Photography, visual presentation and narration, as well as the subject matter were highly praised: ". . . an excellently illustrated film from the technical aspect and reviews the common fractures very well . . . believe it would be a very useful adjunct in any teaching program." The "simplicity," "ease of comprehension" and "excellent drawings" make it a valuable teaching film according to the previewers.

A number of previewers commented on errors and controversial procedures, as exemplified in the following: "Two small things were noted, one being that in illustrating the ulnar nerve a small branch was shown coming off . . . about two inches above the elbow joint where there is no branch. Also, we have . . . found that the posterior splint is rather unsatisfactory. . . ." However, no one defect was criticized on more than one appraisal form.

Distribution: Churchill - Wexler Film Productions, 801 N. Seward St., Los Angeles, Calif.

Lung Cancer Film Well Liked

"Lung Cancer: The Problem of Early Diagnosis" has completed the preview circuit. The following reactions are based on the first 79 appraisal forms returned by the medical school previewers. The 79 appraisals represented 192 faculty members. In addition, 668 student viewers were reported.

"Excellent" was the overall rating given to the film by 51 per cent of the previewers as shown in Figure 1.

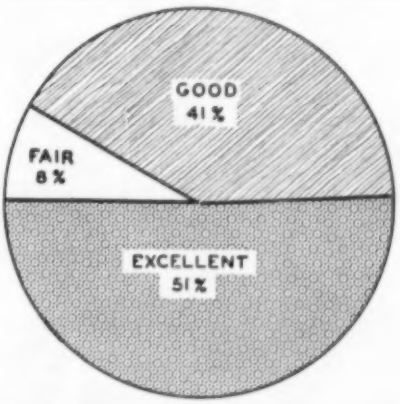


FIGURE 1. Percentage of previewers rating the film as fair, good or excellent (no appraisers rated the film "poor").

Eighty-six per cent indicated the film is well suited for medical students; 67 per cent that it is well suited for interns and residents; and 47 per cent for postgraduates. Twelve per cent indicated that it is suited for the general practitioner. Nurses, dental students and the public were

mentioned infrequently as being suitable audiences.

Approximately 50 per cent deemed the film well suited for presentation as integral part of instruction; 33 per cent considered it suitable for providing a review of a unit of instruction and 24 per cent considered it suitable for providing an introduction to a unit of instruction.

Practically all previewers thought this film should be part of their college library or was one which they would want to borrow or rent from time to time.

Subject matter, organization, accuracy, techniques and photography were consistently applauded. The following comment is representative: "It reflects a great deal of ingenuity and organization of material, techniques of photography were almost too good to be true, and the film should certainly be useful at all levels of instruction and as any part of instruction." No one weakness was consistently mentioned.

Distribution: American Cancer Society, Inc., 521 West 57th St., New York 19. **Sale:** $134, **Loan.** State Cancer Societies, **Loan.**

Report on "Nephrosis in Children"

Forty-eight per cent of the previewers rated "Nephrosis in Children" good as indicated on the first 100 appraisal forms returned to the Medical Audio-Visual Institute from the medical colleges after seeing the film on the Preview Circuits. The overall appraisals given the film are shown in Figure 1.

FIGURE 1. Overall ratings given to "Nephrosis in Children" on 100 appraisals.

Ninety-two per cent of the appraisers thought the film suited for undergraduate medical students. The audiences for which the film was considered suitable is shown in Figure 2.

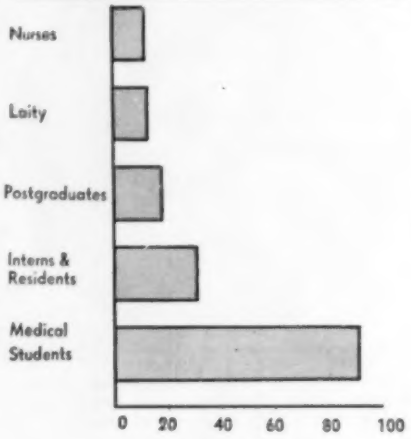


FIGURE 2. Audiences for which the appraisers indicated "Nephrosis in Children" was suited.

Fifty-eight per cent of the appraisers indicated that the film is well suited to provide an introduction to a unit of instruction; 35 per cent deemed it suited for presentation as an integral part of instruction, and 19 per cent deemed it suitable for providing a review of a unit of instruction.

The technical qualities of the film were considered excellent and the presentation of the subject very good. The comments under "weaknesses of film" referred most frequently to the level of the film. Many felt it was too elementary and therefore usable only as an introduction for medical students. All did not feel the prognosis as portrayed could be generally agreed upon.

The first 100 appraisal forms, from which the above is derived, represents 371 faculty previewers. In additions to faculty members, 1065 students were reported as having seen the film while it was on the circuit. *(For a review of "Nephrosis in Children" see J. Med. Educ., December 1954.)* J. E. F.

Summaries of Film Reviews

Hemolytic Streptococci and Phagocytosis

30 min., sd. (magnetic) b&w., 16 mm., 1955.

Sequences are shown of the streptococcal capsule; growth by time-lapse photography of streptococcal chains; hemolysis; the appearance of normal blood elements by phase contrast microscopy; the method used in making glass-slide preparations for microscopic observations; the process of phagocytosis; surface phagocytosis; the difference between virulent and non-virulent streptococci in resisting phagocytosis; phagocytosis by a monocyte; the egestion of phagocytized streptococci by neutrophils and the dramatic injury produced in leukocytes following ingestion of certain streptococcal strains.

This phase miscroscopic film study is a valuable, revealing and fundamental visual essay which says much but leaves much unsaid and unexplained. It is provocative to students and faculty as authentic living bacteriology and pathology. The time lapse film quality, the editing with its light flashes and black leader, cut-in titles and the magnetic stripe leaves much to be desired, but does not materially interfere.

For students of bacteriology and pathology this film will be stimulating and rewarding, in part or as a whole, with the magnetic sound track voice or with spoken commentary by the teacher. Such a film should probably be a part of the basic visual library in all medical teaching centers. D.S.R. with K.U.M.C. Panel, May 1955.

Audience: Students of bacteriology and pathology.

Reference: Egestion of Phagocytized Particles by Leukocytes by Armine T. Wilson, M.D. **J. Exp. Med.** 1953, **98**, 305.

Production Data: Sponsors: Alfred I. du Pont de Nemours Institute, Wilmington, Del., with assistance from the Helen Hay Whitney Foundation, New York; **Author:** Armine T. Wilson, M.D.

Distribution: The author, Alfred I. du Pont de Nemours Institute, Wilmington 99, Del.

Drug Addiction—A Medical Hazard

27 min., sd., color, 16 mm., 1955.

A prologue by the president of Winthrop-Stearns, Inc., states the film's purpose. Hon. Harry J. Anslinger, speaking to a class of medical students, tells the facts of opium alkaloid addiction. He tells the case history of George Smith, M.D., whose drive toward professional and social success leads him down the road to "no uncertain destruction," first with alcohol, followed by morphine addiction. His progressive deterioration through addiction is interrupted by the Federal Bureau of Narcotics and George Smith is sent to Lexington Federal Hospital for temporary cure of his addiction. Discharged, his medical license revoked, moved to a far town and working in a gas station, Smith finds life empty and drifts back to addiction via drugs from the underworld narcotics traffic. Stealing because he cannot afford the drug, he is sent to prison for five years. In conclusion Anslinger emphasizes the pattern of addict occurrence in doctors with "character defects."

This grim case history of a physician's addiction is filmed in the setting of the University of Maryland Medical School's successful 20-year campaign to prevent addiction in their graduates. The objective and subjective force of the case history, abetted by the intensity of Mr. Anslinger's personality and the telling phraseology of his narration, is well calculated to bring warning thoughts and long memories to students. Minor film flaws and a certain overdramatization do not interfere with transmission of the message.

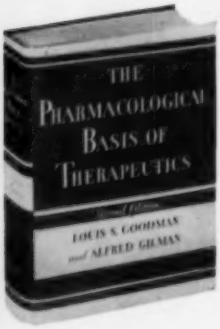
Use of the film is obviously a restricted one. Medical students and medical practitioners are the *only* audiences, unless careful use with nurses can be undertaken on occasion. Persons familiar with other patterns of addiction can add much to a discussion. The film's use should be rigidly controlled by the sponsor-distributor. D.S.R. with K.U.-M.C. Panel, 1955.

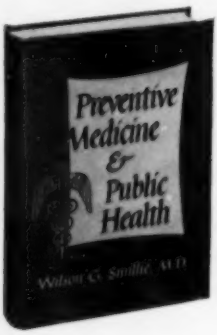
Audience: Medical students, practitioners (occasionally nurses).

Production Data: Medical Sponsorship: Federal Bureau of Narcotics and Department of Pharmacology, University of Maryland; **Sponsor:** Winthrop-Stearns, Inc.; **Scientific Adviser and Script:** John C. Krantz Jr., Ph.D., University of Maryland; **Producers:** Stark Films; **Narrator:** Hon. Harry J. Anslinger, U. S. Commissioner of Narcotics.

Distribution Data: Winthrop-Stearns, Inc., 1450 Broadway, New York 18. **Loan**

TOPS IN EACH FIELD





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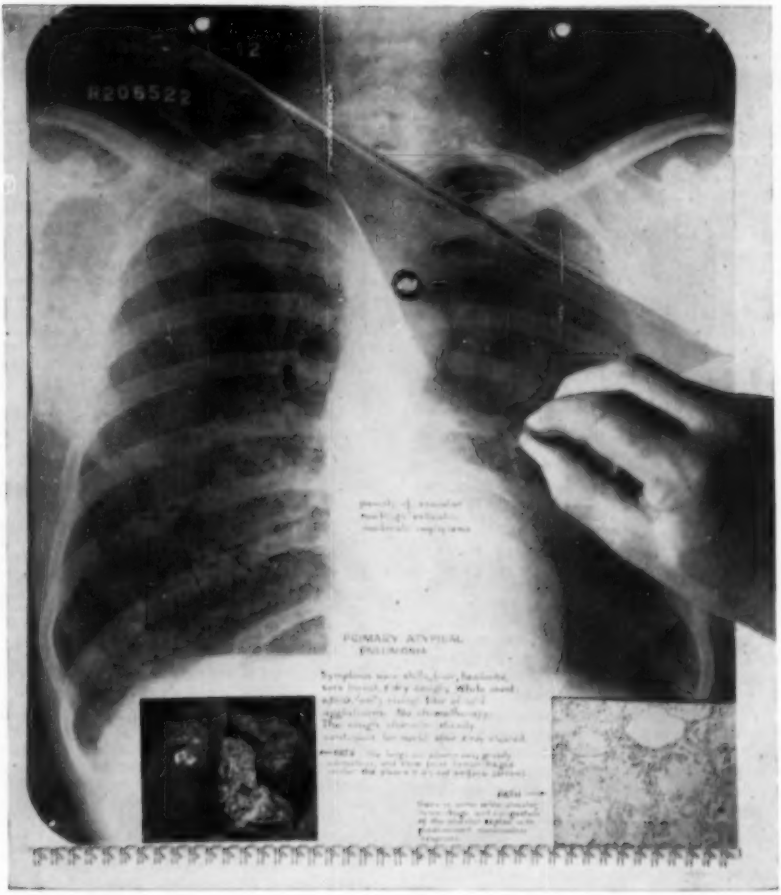


X-Ray Teaching Film

At Western Reserve the 11″ x 14″ chest x-ray film is being adapted for student reference purposes by the use of an overlay which provides directive arrows and supplementary photographic material (see cut). Two double acetate envelopes hinged at the bottom are used. One envelope contains and protects the x-ray film. The other envelope contains the printed and photographic supplementary material. A pair of eyelets are placed on the upper edge of each envelope. These eyelets fit over light pegs custom-built at the top of the view box being used so that the overlay may be easily removed and replaced in register by the student.

The window sleeves are made of mikafilm with a double spiral wire binding at the bottom. The colored transparencies of the gross and microscopic anatomy are placed in the overlay envelope with pressure sensitive Scotch tape. An acetate ink is used to print the verbal cues.

The teaching x-ray film was developed by Dr. Myron Perlich, internist, Bernard Dryer, Director, AV-TV Laboratory and Alan Podis, medical student and artist. It is expected that the educational use and the details of construction will be pointed out in a future article or report by the developers.

The Personnel Exchange

Faculty Vacancies

• M.D.—Scientist: Wanted for staff appointment 1000 bed hospital; age preferably 30 to 40; minimum 2 years clinical experience diagnostic and therapeutic uses of radioisotopes. Excellent opportunity clinical research in academic atmosphere in completely equipped radioisotope research laboratory in medical center large city southwest U. S. Address: P. O. Box 17004, Houston 31, Texas.

• Director Radioisotope Unit: M.D., certified internist preferred. Splendidly equipped unit for clinical care of patients and research laboratory. Duties include administrative supervision, teaching in residency program, assistance other services in research. General hospital, 1000 beds, affiliated with medical college. Faculty appointment. Address: V-30.

• Unesco has been asked to suggest candidates for the following posts abroad: Professorships in pathology, international medicine, surgery and ophthalmology (Tabriz, Iran). Professorships in physiology, chemistry, surgical dentistry and dental prosthetics (Baghdad, Iraq). Professorships in anatomy and physiology and lectureships in anatomy, physiology and pharmacology (Jerusalem, Israel). A number of professorships and lectureships in various preclinical subjects (Djakarta, Djocjakarta and others in Indonesia). Address: Enquiries and applications to UNESCO, Exchange of Persons Service, 19 avenue Kléber, Paris 16, France.

• Director—Medical Education: 750 bed nonprofit hospital with Protestant church affiliation desires services of physician with a background in the field of medical education with administrative ability to direct resident and intern program and to key continuing attending staff medical education. Excellent salary opportunity. Address: V-32.

• Virologist: Full-time faculty position in Eastern medical school department of bacteriology now occupying new laboratories for virus research, including facilities for tissue culture. Teaching of medical and graduate students. Time for research of own choosing. Rank and salary depend on experience and training. Address: V-33.

• Fellow in Forensic Pathology: Fully approved; complete facilities for training in pathology, toxicology and administrative legal medicine. Remuneration commensurate with training and experience. Reply: Department of Legal Medicine, Medical College of Virginia, Richmond, Va.

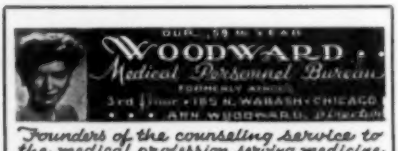
• Physiology: Assistant professor, Dalhousie University, Halifax, Nova Scotia. Salary $4,800. Teaching load not heavy. Ample opportunity for original research. Apply to the dean, faculty of medicine.

• Public Health Physician: New York State Department of Health has opening for a public health physician who has specialized in diagnosis and treatment of tuberculosis, including the interpretation of chest X-ray films. Salary $10,470, with five annual increments to $12,510. Benefits. Qualifications include citizenship, possession of or eligibility for New York State medical license, and four years of specialized tuberculosis experience. Further information from Richard H. Mattox, Director, Office of Personnel Administration, New York State Department of Health, State Office Building, Albany 1, New York.

• Dental Surgeon: University of the Witwatersrand, Oral and Dental Hospital and Department of Dentistry, Johannesburg, S. Africa. Senior full-time dental surgeon, lecturer and clinical lecturer in dental prosthetics and dental mechanics. Salary and allowances £1,600 x £50 to £2,100 per annum plus £234 per annum temporary cost-of-living. Address: William D. Carter, Head, Exchange of Persons Service, UNESCO, 19 Avenue Kleber, Paris 16, France.

Personnel Available

• Physiologist: Ph. D. Now assistant professor Midwest medical school. Broad training physiology and physics. Fellowships. Teaching experience in medical and dental physiology, graduate biophysics. Active research on circulation in perfused organs under own grant; and aid in group studies in environmental stress. Extended experience in aviation physiology and applied physics, including many designs. Desires position in East with active teaching assignments, independence of research, chance to develop biophysics program for medical and graduate curriculum. Address A-147.



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Information for these columns should reach the Personnel Exchange, Journal of Medical Education, 185 N. Wabash Ave., Chicago 1, Ill., not later than the 10th of the month which precedes the month in which the listings will appear.

• THORACIC SURGEON: 37, university-trained and qualified in general and thoracic surgery. Prefer limitation to thoracic and cardiovascular surgery. Experience in cardio-pulmonary physiology. Desire teaching position. Presently on surgical staff of eastern university. Eligible for boards in general and thoracic surgery. Completed Part I Boards in general surgery. Available after August 1. Address: A-156.

• INTERNIST-HEMATOLOGIST: M.D. Presently full-time assistant professor of medicine at large midwestern university hospital. Qualified for American Board of Internal Medicine. Member of Alpha Omega Alpha, American Federation for Clinical Research, American Association for Advancement of Science. Experienced clinician, teacher and investigator. Director of radioisotope laboratory. Numerous scientific publications. Interested in changing location, particularly West Coast, in academic position or private practice with teaching and research opportunities. Address: A-157.

• CHEMIST: Ph.D., minor in biochemistry, male, 10 years of research in medicinal chemistry, large pharmaceutical house. Publications, patents. Desires position in chemical-biochemical research in medical field. Particularly interested in position which would broaden experience by contact with other medical sciences. With or without teaching. Address: A-158.

• PHYSIOLOGIST: Ph.D., male, 30, family. Desires research and/or academic position in eastern part of U.S. Three years experience as research biologist with large eastern pharmaceutical company. Also teaching experience. Address: A-159.

• MICROBIOLOGIST: Medical, male, Ph.D., 37, married. Experience includes public health laboratory, industry (antibiotic research), and teaching all phases of medical microbiology. Present position associate professor microbiology in medical college. Wide research background in antibiotics, immunology, tuberculosis, bacterial dissociation. Have some training in use of isotopes. Desires teaching appointment with research opportunities in a medical school located south. Address: A-160.

• MICROBIOLOGIST: Ph.D., 30, presently assistant professor in medical school. Desires position in medical school in teaching and/or research with opportunity to complete work toward M.D. at least part time. Publications, associations, family, honorary societies. Ambition teaching and research in basic science. Address: A-161.

• ENDOCRINOLOGIST—PHYSIOLOGIST—ANATOMIST: with administrative experience desires position in graduate school of arts and sciences or medical school in teaching-research position. Harvard Ph.D.; seven years teaching-research experience, six years at Harvard. Extensive experience in endocrinology, general physiology, histology, medical genetics and zoological sciences. Interested in experimental medicine. Many publications. Membership in Sigma Xi, Kappa Delta Pi, Phi Sigma, N.Y.A.S., A.A.A.S., Amer. Soc. Zool., and others. Will accept administrative responsibilities. Address A-162.

• PHARMACOLOGIST: Ph.D., 26, married, two children. Director of research for established pharmaceutical company and medical student with part-time standing. Original publications, scientific societies, Soc. Experimental Biology and Medicine; American Federation for Clinical Research. Desires academic position with research possibilities while finishing medical school. Address: A-163.

• BACTERIOLOGIST: Male, 38, M.Sc., married. Seven years teaching and research experience in medical bacteriology. Desires part-time position with opportunity to work toward advanced degree. Present total college credit 260 semester hours. Present position an instructor in pathogenic bacteriology in medical school. Address: A-164.

• PUBLIC HEALTH AND PREVENTIVE MEDICINE: M.D. M.P.H. Fellow of the American Public Health Association, age 44, to be discharged from Army tour May 31, 1955. Desires to teach in a department of public health and preventive medicine, in a medical school. Six years experience in the practice of public health with some teaching experience, other experience in psychiatry and general practice. Address: A-165.

• ANESTHESIOLOGIST: 32, married, three children, veteran. Interested in heading a university anesthesia department. Five years experience in internal medicine before entering anesthesiology. Experienced in teaching and research. At the present time completing training at leading university hospital. Available December 1. Address: A-166.

• VIROLOGIST—BACTERIOLOGIST: Male, Ph.D., age 30. Teaching and research experience in medical bacteriology, general microbiology and virology. Tissue culture experience as applied to virology. Desires teaching position with opportunities for research. Address: A-167.

• OBSTETRICIAN-GYNECOLOGIST: Male, married, Board eligible. University teaching experience. Seeking change of location. Prefer full-time permanent academic position with opportunities for clinical investigation. Address: A-168.

• PHYSIOLOGIST: Ph.D., 39, broad biological training. Wide experience in teaching and research. Desires teaching position with opportunity for research. Experience in biometry. Research interest and experience in connective tissue permeability and biological effect of x-rays. Immediately available. Address: A-169.

• PEDIATRICIAN: Female, single. Candidate for M.P.H. Diplomate, American Board of Pediatrics. Interested in child health, teaching and research positions. Available July 1. Address: A-170.

• INTERNIST-CLINICAL PATHOLOGIST: Certified in both specialties, age 44, recently discharged from military service. Extensive research and teaching experience. Listed in coming editions of Am. Men of Science and Blue Book of Awards. Desires permanent ranking academic and/or research position. Will consider directorship of hospital laboratories. Address A-171.

• INTERNIST: Age 31, M.Sc. (Med.), desires full-time administrative or clinical teaching post in a medical school or hospital. Has teaching and research training. Available September 1955. Address: A-172.

• SURGEON: Age 32, veteran, married. University - trained. Diplomate American Board of Surgery. At present instructor in surgery large midwestern university hospital, desire full or part-time academic appointment for teaching and research as well as clinical. Address: A-173.

• PHYSIOLOGIST-ENDOCRINOLOGIST: Ph.D., married, veteran. Eight years teaching experience. Presently assistant professor at medical school. Wishes to relocate on the Pacific Coast or in Canada for health reasons. Member of many professional societies. Publications. Desires teaching position and research opportunities. Available summer 1955. Address: A-174.

• OBSTETRICIAN - GYNECOLOGIST: 45, married. Diplomate of American Board. Now assistant professor in large eastern university college of medicine and full-time director of service in an affiliated medical center. Extensive and varied clinical experience. Teaching experience at both undergraduate and postgraduate levels. Experience in administrative and executive capacities. Several clinical scientific publications. Desires full-time teaching position as department head in a university college of medicine with ample provisions and opportunity for both basic and clinical research. Address: A-175.

• GERMAN PHYSICIAN AND SURGEON: Educated Frankfurt/Main University, now in practice in Frankfurt/Main. Seeks academic position in United States, also information on residencies or internships. Address: A-176.

• RESEARCH ASSOCIATE: in fields of virology, bacteriology or immunology in a medical college. Ph.D. in bacteriology from State University of Iowa. Address: A-177.

• PATHOLOGY-BACTERIOLOGY: Desires teaching and research. Presently director of laboratories and medical examiner in U. S. Overseas Territory (Guam). Research work on tuberculosis and amyotrophic lateral sclerosis. Publications, societies. Ph.D. in microbiology. Teaching experience. Address: A-178.

• ANESTHESIOLOGIST: M.D., Ph.D., bio-chemistry and pharmacology, university trained and experienced. Available and interested in opportunity, preferably East coast, beginning July, Address: A-179.

• MEDICAL WRITER: Woman, B.S., B.J., University of Missouri, 1950. Major in special writing; five years newspaper experience; will have completed 16 credit hours in university school of medicine by August. Membership in Theta Sigma Phi and Kappa Tau Alpha, national honorary journalism fraternities. Available September 1. Address: A-180.

• PHYSIOLOGIST: Ph.D., 33. At present holds teaching and research position in medical school (6 years). Present rank assistant professor. Desires teaching position with research opportunities. Address: A-181.

• MICROBIOLOGIST: 24, Indian, B.Sc. (Microbiology) and B.Sc. (Chemistry) Bombay University. Experience in virus research and laboratory and serological work. Desires to study for Ph.D. in microbiology or bacteriology. Prepared to work on stipend or fellowship under any capacity. Address: A-182.

• BIOCHEMIST: Chemical pathologist, 28, Indian. B.Sc., M.Sc. Bombay with biochemistry, chemistry of food and drugs, first class B.Sc. (tech.) Research experience in enzymology, sterols. Taught chemical pathology, hospital biochemist for three years. Desires postgraduate studies in biochemistry or chemical pathology leading to Ph.D. Prepared to work on stipened or fellowship in any capacity. Address: A-183.

• PSYCHIATRIST: 31, male, M.D., B.A. (psycology), seeks part-time teaching position in Philadelphia area. Experience in teaching at graduate and undergraduate level. Dynamic orientation. Address: A-184.

• PHYSIOLOGIST: Ph.D., 28, married. Experience in research and teaching mammalian physiology. Research interest in neurophysiology and comparative physiology. Publications. References. Desires teaching-research position. Address: A-185.

• SURGEON: University trained, certified by general and thoracic boards, early 40's, family. Experienced in applied cardiopulmonary physiology as well as all phases of thoracic and cardiac surgery. Presently director of large teaching unit in East. Publications include basic investigation. Desires relocation, preferably full-time, with opportunity to develop own unit along three lines, service to patients, teaching and investigation. Address: A-186.

• MEDICAL ILLUSTRATOR: Male, single, 27, draft exempt, presently employed full-time in a university medical school and hospital. Desires changes and position with better future. Six years actual experience in scientific and technical illustration for lantern slides and publication. References and samples will be furnished. Address: A-187.

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